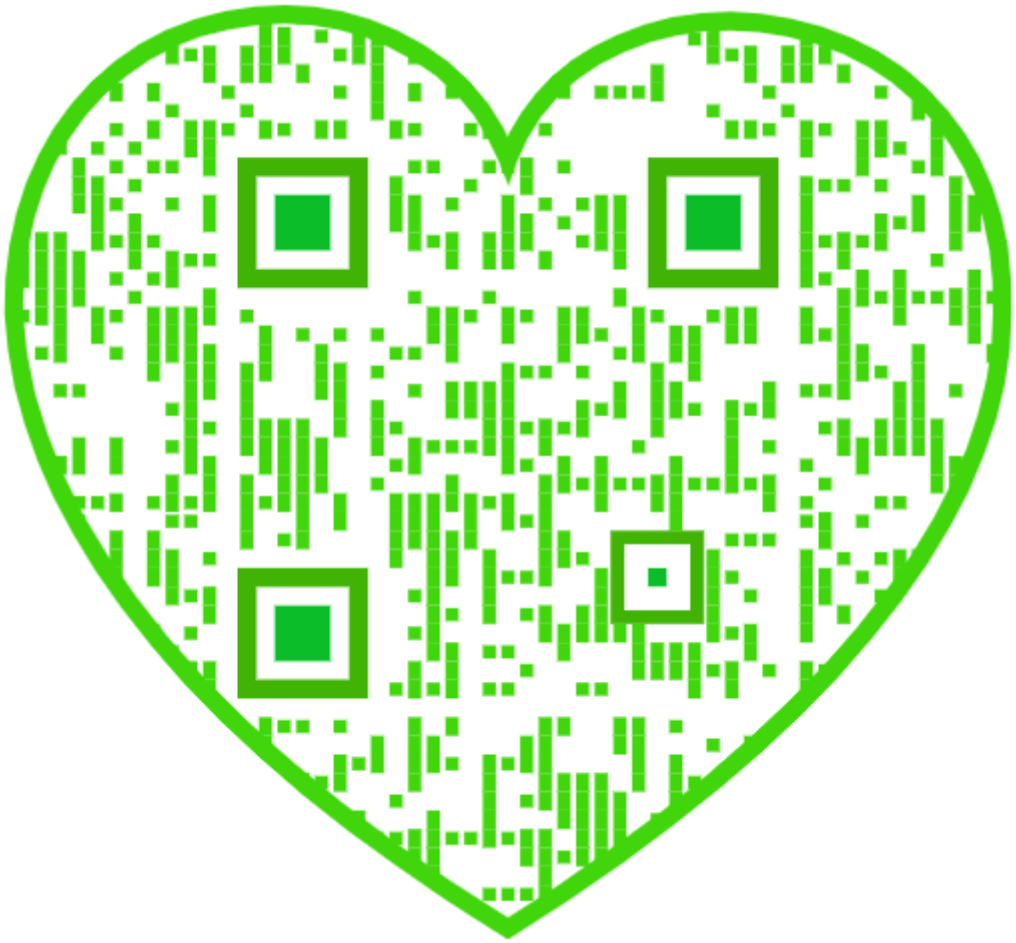

SEASIDE PLANTING

OF

TREES AND SHRUBS

A VIEW FROM LYTHE BANK,

Looking towards Land's End, the railway, and the sea (Mulgrave Estate).

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SEASIDE PLANTING

OF

TREES AND SHRUBS

BY

ALFRED GAUT, F.R.H.S.

ILLUSTRATED FROM PHOTOGRAPHS
BY FRANK SUTCLIFFE

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INTRODUCTION

ALL books nowadays have a preface. Let me give, as an introduction to this one, the reply made by the photographer (Mr. Frank Sutcliffe) to a friend who met him one evening when returning from the plantations at Mulgrave. On being asked, "What fields he had been making conquests in?" the answer was, "I have been taking some photographs for a gentleman who is going to do away with the 'north wind.'"

This, the reader will understand, expresses my intention, to a certain extent, in a few words. It is an endeavour to show how the evils may be mitigated which are wrought upon vegetation of all kinds, not only by the north and east winds along the eastern coast, which are most destructive, but also upon every part of the shores of the British Isles, which are exposed to strong gales and storms.

It has not been considered advisable to attempt anything like a detailed survey of every

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portion of the shores of Great Britain and Ireland, as such matter would be much too elaborate, would fill volumes, and serve no useful practical purpose.

The main object of this work is, not to furnish an encyclopædia or nomenclature of British Seaside Plants, but to endeavour to demonstrate by plans, illustrations, and notes following on a close and careful survey of one particular portion of the coast, "*how the very difficult problem of planting up exposed situations may be solved.*"

The terms "exposure to strong gales," "keen winds," and similar phrases, which frequently occur in these pages, would convey the same idea whether applied to the North, South, East or West shores of these islands, or even the summits and slopes of hills and other exposed situations inland. The methods as advised, of fencing and planting up protective barriers against such adverse influences, would have a general practical application in every case.

Taking all these matters into consideration, it was thought that the best plan would be, to select only one portion of the British coast, namely, that of Yorkshire, for the purposes of observation, for the following reasons, viz.:—

(1) Because the main subject under considera-

tion being to build and plant up effective barriers against strong winds and gales, one portion of the coast would be quite sufficient to serve as illustrative of the whole.

(2) Because it is one of the bleakest, most exposed, most difficult, and, therefore, one of the most suitable which could possibly be selected.

(3) Because the author has had exceptional opportunities of making close and careful surveys on various matters of detail associated with sea-side planting, especially for several years past in Yorkshire.

Every portion of the land around the shores of Great Britain and Ireland is more or less exposed to strong gales, storms, and keen, cutting winds.

In those parts where the coast is rugged in character, as along the west of Ireland and Scotland, or where the larger rivers widen out as they approach the oceans, there are many sheltered nooks which are not at all difficult to plant, and this is particularly intensified where, added to this, high hills intervene as breaks to the winds.

On the other hand, where promontories or narrow portions of land push their headlands far out to the sea, every part of these coasts may be under exposure to such a degree as to render

planting up under such conditions extremely difficult.

For several years I was engaged in research work among the hardy cultivated fruits of Yorkshire, and when visiting those parts of the county bordering upon the sea, for the purposes of observation and collecting information, the great difficulties experienced by growers in the cultivation of orchard fruits, owing to the want of the necessary shelter, especially that offered by other trees and shrubs, were prominently brought to my notice.

Also for some considerable time when, in connection with the duties of my calling, I have been engaged in giving lectures and demonstrations in Horticulture, and fulfilling other engagements in these and other districts by the seaside, complaints have reached me from farmers, gardeners, villa residents, allotment holders and others, how much farm and garden crops are injured by cold, cutting winds and strong gales from off the sea, at all seasons of the year.

This induced me to take up the present work, with the hope that it might lead to more extensive planting, as such would prove of incalculable benefit in many ways.

In these researches I have been greatly assisted

by several gentlemen who possess sound practical knowledge bearing on seaside planting, gained from a wide and long experience. This should give confidence to readers, particularly to those who wish to plant trees and shrubs by the sea-shore, and do much to prevent a recurrence of the many unfortunate mistakes which have been experienced in times past, and which have proved sources of discouragement to many who have wished to beautify their surroundings and to shelter themselves from the winds.

It must be acknowledged that there are difficulties which have to be met, but these are not insuperable, as the photographic illustrations taken from such bleak positions as the Scarborough cliffs, the neighbourhood of Robin Hood's Bay, Whitby, and Mulgrave, conclusively prove.

The author's grateful thanks are due to Mr. Frank Sutcliffe for the many beautiful photographs with which this work is illustrated, and in which he has taken a deep interest; to the Rev. the Marquis of Normanby for permission to photograph in the plantations at Mulgrave, and to Mr. Christopher Richardson, Field House, Whitby, for a similar kindness; to Mr. George L. Beeforth, F.A.S., The Belvedere, Scarborough, and to Mr. John Warren Barry, M.A., Fyling Hall,

Robin Hood's Bay, not only for the photographs taken upon their estates, but also for their valuable assistance in giving much information which is embodied in these pages; to Vice-Chancellor Nathan Bodington, M.A., Litt.D., The University, Leeds, for his kind interest; and to Mr. R. C. Gaut, B.Sc., Agricultural Department, County Offices, Preston, for his help with the manuscript.

In the matters of the nomenclature of trees and shrubs, their native habitats, dates of introduction, etc., the following works with few exceptions have been followed, viz. :—Nicholson's *Dictionary of Gardening*, Loudon's *Arboretum*, Bentham's *Handbook of the British Flora.*

ALFRED GAUT, F.R.H.S.

THE UNIVERSITY,
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CHAPTER I

ADVANTAGES OF PLANTING TREES AND SHRUBS ON THE SEA-COAST, AND IN DISTRICTS NEAR TO THE SEA.

It is not the intention in the present work to take into consideration the afforestation of any part of the country for the purposes of affording supplies of fine timber; there are already several useful works in circulation treating in the most comprehensive manner with this part of the subject. The main object is to deal with planting on the immediate seaboard and in the most exposed positions near by.

Trees in such situations cannot be expected to grow into fine timber, but the shelter which they afford when judiciously arranged exerts a beneficial influence upon others growing farther inland, as well as upon farm and garden crops.

In the economy of man and of Nature, the advantages gained in planting in such bleak situations are of a more indirect character, and

will be considered under the following heads :— (1) Effects on the landscape; (2) Influence on climate, soil, and crops; (3) As affording shelter to man and beast; (4) As affording resting and nesting places for useful birds; (5) As checking erosion of the cliffs.

Effects on the Landscape

A journey by train along the Yorkshire coast no doubt is very attractive to many people who are frequent visitors to its popular seaside resorts. Here and there, rushing along, glimpses may be caught of the sea, the passing vessels, delightful bays, the rugged cliffs and headlands. These at the present time constitute its chief charm; but to the lover of sylvan scenery, the barren and bleak appearance presented through almost the whole line of country must prove peculiarly dull and uninteresting.

It seems quite a relief suddenly to come upon one of the several beautifully wooded glens and ravines which here and there run up from the sea, often to some considerable distance inland. Some of these cannot, perhaps, boast of fine timber, many show only a scrubby growth of trees and shrubs, but even a sight of one of these greatly relieves the monotony of the journey after passing through districts almost destitute of trees.

Strike a comparison between the bleak districts and others in which trees in quantity are to be found, as, for instance, along the foreshore at Scarborough, on the South Cliffs with the Valley Bridge to the west, the esplanade, and some of the beautiful drives from the town ; also through the Esk valley from Whitby, with its delightful woodlands and the grand sylvan scenery of Mulgrave.

What a magnificent sight is presented in a fine plantation containing many different species and varieties of evergreen and deciduous trees. Every season rings its changes : in winter the sombre dark colouring of the Conifers mingles with the branches, destitute of leaves, of their neighbours, added to which in early spring the light green foliage of the Larches affords a striking contrast ; then, later on, to those are added other spring and summer foliage in all their varied hues. The sun rising and setting upon such a plantation, when the foliage takes on its autumn colouring, is one of the grandest sights in Nature.

This great variation in the colouring of the foliage of the forest is interesting to watch, and constitutes one of the greatest charms of rural scenery.

Almost everybody likes to have trees and shrubs about them. The landed proprietor greatly values his fine timber and woods. The

villa resident seeks to shut himself in from the public gaze by thickly planting his surroundings, and perhaps likes to see some of the rarer specimens growing in his garden.

The æsthetic value of any part of the country which is well and artistically wooded is of the highest importance, exercising as it does a great and beneficial influence on the social, moral, and physical development of its people.

Much can be done in this way along the eastern coast. A more extensive planting of trees would not only greatly add to the pleasure and comfort of its residents, but also render its seaside resorts more attractive to the numerous summer visitors who frequent these parts, during their holiday seasons of rest, pleasure, and enjoyment.

Influence on Climate, Soil, and Crops

The climatic conditions affecting the culture of trees, shrubs, and other plants, vary much in different parts of the long extent of land surrounding the shores of the British Isles.

These are the results of various atmospheric phenomena, such as the direction and force of winds, oceanic streams and currents, elevation of land, the amount of rainfall, clouds, and mists affecting atmospheric and soil humidity, and other causes.

TREES IN THE PARK ON THE MULGRAVE ESTATE.

SHELTER FROM THE SEA

Afforded to garden and grounds by boarded fence, a hedge close to the fence, and Wych Elm and Sycamore trees (Field House, Whitby).

The direction and force of winds naturally exercise important influences on atmospheric and soil temperatures and humidities. The climate on the eastern coast is colder than that on the west; on the eastern shores of Great Britain, the north winds sweep down from the colder oceanic regions, the easterly winds in winter and spring come over the German Ocean from the vast ice-clad northern parts of the main continent, added to which the warm westerly winds are largely shut off by the high ranges of hills which intervene in different parts of the country inland.

The south-westerly winds sweep over the land, and bring with them the temperatures and humidities of the vast Atlantic Ocean from which they come. The Gulf Stream, which bathes these shores, brings with it much of the warmth from the tropics. This as it reaches this country serves to render the temperature mild in character, more especially on those parts of the coasts of Ireland and Scotland which, from the direction of its main currents, are more directly under its immediate influences. The temperature of the German Ocean in January is about 41° Fahr., or 2° warmer than the air; while the temperature of the Atlantic on the north-west of Scotland at the same time of year is 45°, or 5° warmer than the air.

It has been clearly demonstrated, by experi-

ments conducted at various stations in this and other countries, that both atmospheric and soil temperatures have been raised when trees in quantity have been planted in places which were previously exposed. Even such shelter as that afforded by a single hedge will often cause a rise in temperature of 2° to 3° F. for some considerable distance from it.

Proof of the influence of the foliage of trees upon the humidity of the soil may well be given from the observations of various writers on forestry and arboriculture in the New World. The destruction of the great forests of North America, owing to the onward march of the settler, and the introduction upon a gigantic scale of arable husbandry, have had the effect not only of altering the character of the landscape, but also of diminishing the annual rainfall in those districts, to such an extent that in the drier seasons conditions of drought arise approaching those on the fringes of the great deserts.

While the total annual transpiration from the surface area exposed by the innumerable leaves of these forests must have been enormous, and the drain upon the soil water in consequence very great, yet the other drying influences which ordinarily come into play in causing the rapid evaporation of water, such as the drying effects of winds, evaporation of water due to direct solar

heat, would be almost negligible, as the great forest barrier and the impenetrable masses of foliage would prevent their action.

The deep beds of humus which formed the surface soil were themselves great water-holding masses, and with their superficial layers of dry leaves lost but little moisture to the atmosphere.

Owing to the somewhat insular position of Great Britain, and its much smaller area as compared with that of the vast continents of the New World, the effect of the foliage of trees in quantity upon atmospheric and soil humidity is not so great, yet in a lesser degree it illustrates the advantages which may be gained by planting up open districts.

The great disadvantage to which these open districts are subject is that of fluctuation of atmospheric humidity. At certain times the atmosphere over the land upon the sea-coast, and for some considerable distance inland, is heavily laden with moisture off the sea; at other times strong winds from certain directions prevail which, having but little to check them, cause by their drying influences deleterious effects on vegetation.

The presence of trees in quantity would lessen to a great degree the fluctuations of water vapour in the atmosphere during the warmer periods of the year, and would in a measure counteract the effects of seasons of small annual rainfall, which

are so harmful to vegetation; water would be conserved to the soil by condensation from the atmosphere, to be utilised by growing crops, and a more equable climate would be obtained.

The importance of shelter afforded by trees and thick hedges in quantity to farm and garden crops cannot be too highly estimated. The productive capacity of the soil is increased; growth is quickened, in spring giving earlier and heavier supplies; the harvest is hastened, and the cold, icy winds which are so disastrous to fruit and other crops are broken up.

As affording Shelter to Man and Beast

Any one crossing an open and exposed tract of country on a cold, wintry, windy day, and coming at once to some sort of shelter, as that afforded by a plantation, a belt of trees, or even a thick, high hedge, at once experiences great relief; the atmosphere appears several degrees warmer, and it nerves and braces him up when once again he has occasion to face the elements. This is given as an illustration demonstrating the advantages of good shelter-conditions to man, as compared with those of extreme exposure.

Belts of trees on exposed sides of dwellings and homesteads, from the shelter they afford, add greatly to the health and comfort of the residents.

The advantages of shelter to horses and cattle working or grazing in fields and pastures are apparent, as they experience far greater comfort than when their bodies are exposed to keen, biting winds.

As affording Resting and Nesting Places for Useful Birds

It is universally acknowledged that most species of British birds are more or less directly associated with some of the best agricultural and horticultural interests, independent of the great pleasure which they afford to rural residents by the sweet harmony of their song.

Many species, including those which annually visit this country, feed mostly on insects and other pests which are injurious to crops. Some feed upon fruit when ripening, and often in this way commit great havoc in gardens and orchards, but they more than compensate for this in the great benefits they confer in other ways.

Such, then, should be encouraged to increase and multiply. Many insectivorous species rest and build their nests in trees and hedges, and in districts where these are thinly scattered, the absence of birds in quantity is a want which is sometimes seriously felt.

As checking Erosion of the Cliffs

Marine erosion is often, and probably on no coast-line more than that of Yorkshire, of a very extensive and serious nature. Landslips are of frequent occurrence, and occasionally very considerable, especially in those places where the soil is somewhat loose in character, and where the elevations are high on the immediate sea front.

The rate of marine erosion depends upon three main factors: (1) The efficiency of the waves during storm; (2) the nature and resistance of the land; (3) the percolation of water through the soil resulting from land-springs or from soakage.

The loss of land has been carefully watched and measured, during the past half-century, along that part of the Yorkshire coast immediately south of Bridlington. This is composed mainly of loose sands and heavy clays, and it has been found that the land is being washed away at an average rate of nearly $2\frac{1}{2}$ yards per annum. That this is not of recent notice is a matter of common knowledge, for it is well known that such towns and villages as Ravenspur, Auburn, Hartburn, and Hyde, which about the time of the Norman Conquest occupied important positions on the coast, have since been washed away, and that

in less than ten centuries the sea has advanced nearly a mile upon the land.

The planting of ground close up to the high-water mark with suitable trees would do much to check rapid erosion, for their roots, ramifying in all directions, would bind the soil together, and confer upon it a resistance tending to approach that of the harder rocks. At the same time, however, where the soil is loose in character owing to percolating water, resulting from springs or from soakage, the planting of trees would be entirely ineffectual, as they could not gain sufficient root-hold to enable them to withstand the heavy pressure of the wind, such as they would from their position be required to bear.

Drainage of the immediate land, and diversion of the water from the springs into proper channels, would first of all be required, but whether or not it would pay landowners to undertake this work is not within the author's province to discuss.

CHAPTER II

THE FIRST LINE OF EXPOSURE

SATISFACTORY results cannot be expected from seaside planting, unless the first line of fence and planting is arranged in such a manner as to form an efficient barrier against strong gales and cutting winds from off the sea. This expression, "the first line of exposure," will be understood to mean "the most bleak and exposed positions on the immediate sea-front, hilltops, etc., which it is intended to plant up for the purpose of sheltering other woodlands and farm and garden crops beyond." Once this first line is made secure, then planting beyond becomes a comparatively easy matter.

It is noticed that many species of trees and shrubs, which will not thrive in the most central parts of the country, flourish luxuriantly when grown in suitable soil under shelter by the sea. It may not always mean that such plants like the sea air, although sometimes such may be the case; it is more especially because, when under good

A VIEW OF THE SAME TREES AS SHOWN IN ILLUSTRATIONS 3 and 4.

Photograph taken in the grounds on the sheltered side of the fence (Field House, Whitby).

THE FIRST LINE OF EXPOSURE: MULGRAVE ESTATE.

conditions of shelter, such as those afforded by trees, shrubs, fences, buildings, or high elevations sheltering the hollows, dales, and glens, the climate becomes tempered to such a degree that it is actually much warmer in winter and spring than it is farther inland.

Many examples could be quoted in confirmation of the above.

This part of the subject will be treated under the following heads, viz. (1) Choice of positions; (2) Plans and arrangement of trees and shrubs.

Choice of Positions

The configuration of the land all along the coast is subject to much variation, both as regards its general outline of sea-front, and also its altitude, where, as a natural consequence, the high hills slope to all points of the compass. When preparing plans, and in arranging for planting, this must be taken into consideration.

In looking at the map it may be imagined that the prevailing strong winds should come directly off the sea. But it does not always follow that in every case it is those portions of the land that are nearest to the sea which are the most exposed. For instance, there are elevated headlands jutting far out to the sea, which shelter the land in the lower parts of the bays from the

winds to such a degree that vegetation often flourishes luxuriantly almost within reach of the waves. A belt or group of trees arranged according to local conditions and the configuration of the land, when growing near to the edge of high cliffs where the land slopes from the sea, will afford shelter to some considerable distance. Planting should be well followed up under this first protection so formed, so as to carry on the idea of shelter on the landward side.

Where there are high hills with land sloping towards the sea, great care and forethought are necessary in choosing the right positions. Wherever possible, it would be advisable to plant upon the summits as well as upon the slopes. In some cases the slopes might be covered with trees, but on large extensive areas it might not be considered practicable. When tops of the high hills are bare, even when the slopes are planted, there is very little check to the gales on their onward course, and very little shelter is afforded to the country beyond as they sweep over the tree tops, the summits of the hills, and down the opposite slopes with great force. When the summits are covered with trees, obstruction is formed in the path of the winds, which shatters their force, and if the slopes also are wholly or partially planted, the check to the winds is more effectual. Wherever planting is carried out in hilly districts, or on

rising ground for the purposes of affording shelter, the most extreme points of exposure should be well noted, as it is important that the force of the winds should be well broken up in the first line of exposure. In the flat open country the first line of exposure would in all cases be as near to the sea as the trees could be planted.

Plans and Arrangements of Trees

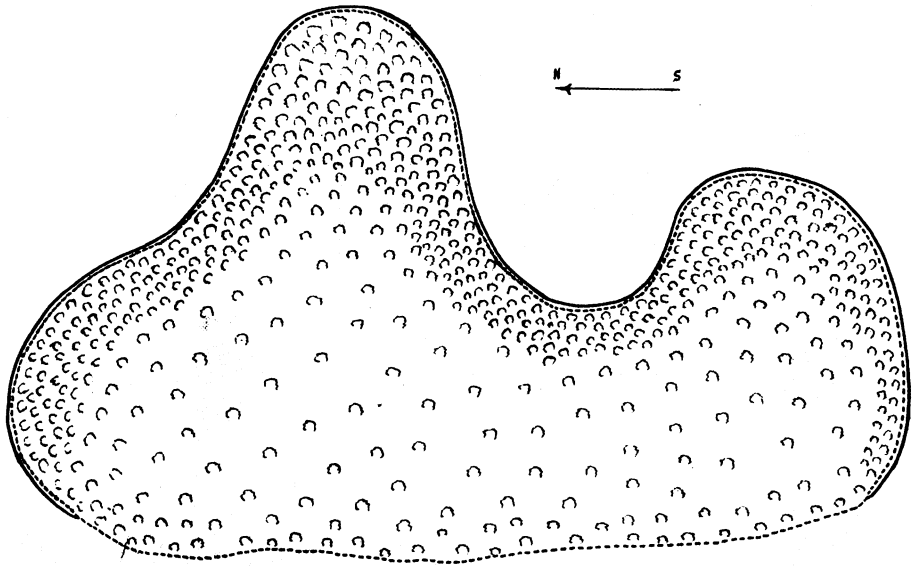
Plans and arrangements for planting trees and shrubs must depend to a considerable degree upon circumstances. For instance, a prospective villa resident, or a landlord of a similar holding, would possibly have very little choice, as his boundary fences and hedges would in most cases necessarily be formed in straight lines, and the arrangement of trees and shrubs in the enclosure would be governed by these. When it is purposed to plant a long stretch of land immediately abutting the sea, where the coast-line is rugged and curved, the conditions are different; the boundary line of fence might possibly follow that of the line of coast. It is impossible to arrange plans to meet every case, but the diagram (No. 6) may serve as an illustration, showing the advantages to be gained in arranging for curved lines of boundary fences on the outer and most exposed sides, as

against those which are straight. The method of planting in accordance with this arrangement, which it is advisable to carry out, is also shown in the diagram.

The north, south, and east sides, shown in the diagram (No. 6) as being the most exposed, are formed in one continuous curved line. The north end and the most northern prominent curve catch the full force of the gales from the north and north-east, sheltering those portions of the belt along the inner line of curve, and partially also that part of the belt which curves prominently outwards southward of the inner curve. The outer or most exposed side of a belt of trees, which runs directly north and south when formed of one continuous straight line, would be fully exposed to the north-east winds all along the line, as there would be no prominent curves to break their force.

The boundary curved line on the north and south ends and eastern sides of the diagram (No. 6) represents a stone dyke, spar and brush-wood, board, or some such fence, which is intended to nurse up and shelter a hedge on its inner side until the latter grows above the top of it, as shown in illustration No. 3.

The two combined, that is, the fence and the top of the hedge above it, will form a most effectual break to the strong winds, and afford a



A PLAN SHOWING THE BOUNDARY LINE,

Fence, hedge, and general arrangement in a belt of trees, in the first line of exposure.

first shelter to the trees in the belt (see illustration No. 3).

The hedge is shown as a dotted line on the inner side of the boundary line on the eastern side (diagram No. 6), and is continued all round, forming the boundary on the western side of the belt.

The boundary fence on the north, east, and south is not continued all round the belt, for the reason that on the western side the trees would not be so exposed to strong, cold winds, and a hedge alone might be considered quite sufficient as a means of shelter. But it must be understood that this is only conditional. In some positions it might be necessary to provide a better means of shelter from the west, as being the most exposed side.

The method of planting is also shown on the plan (No. 6), which is explained as follows :— Very thick planting of the hardiest kinds of trees (see Chap. VI. p. 52) is a requirement in the first line of exposure, so that a dense mass of growth of branches and foliage is formed to catch and break up the first force of the gales. On the Belvedere estate, thick planting has been considered so essential that deciduous trees are to be seen growing from two to three feet apart, the clumps forming almost impenetrable thickets. In the less exposed parts, in wide belts or large

clumps, other kinds of trees may be more thinly planted than those advised in Chap. VI. pp. 52-55.

Belts of trees also should be as wide as possible; narrow belts are practically useless as a means of shelter from the winds.

In some situations round or oval clumps of trees may be arranged in such a manner that their total effect is similar to that obtained by a single wide belt of trees, so as to break up the winds on their onward course (see illustration No. 7).

CLUMPS OF TREES

Arranged in such a manner so as to form an effectual break to the winds, when coming from the direction of an open, bleak tract of country (Fyling Hall Estate).

CHAPTER III

FENCES

FENCES are useful for the purpose of affording shelter to trees, farm and garden crops, horses and other farm stock, to keep them from straying, as guards against the depredations of hares and rabbits, for marking boundary lines, and sometimes for ornament.

Any one or all of the above circumstances may be noted when preparing plans for the erection of fences, but it is only necessary here to deal particularly with those which are to be erected in order to serve as shelter to belts of trees, plantations, etc., this being one of the most essential conditions necessary to successful planting in exposed situations. The following will be considered as among the most useful, viz. (1) Dry stone dyke; (2) Turf dyke; (3) Stone and soil; (4) Spar and brushwood; (5) Board or paling; (6) Hedge.

Dry Stone Dyke

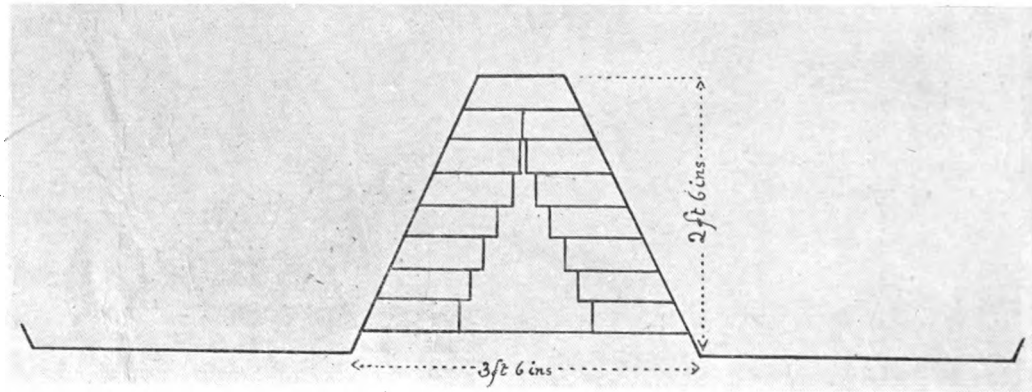
Dry stone dykes are common as boundary fences to fields and plantations in districts where suitable stones are plentiful and easily procurable. They afford good protection for cattle and, when very closely built, against rabbits.

They are not so useful as affording shelter from the winds as good Quickthorn or similar hedges, for the following reason. When the wind in its onward course meets with any solid obstruction, such as a wall, it sweeps over it, the current forming a sharp, short, abrupt curve; but when coming in contact with a hedge its force is broken up, the effect of this being felt some distance beyond.

Dry stone dykes are among the most useful and most desirable fences that can be devised to afford shelter to newly planted hedges, and to nurse them up until they reach the top. When they are extensively used around fields instead of hedges, they are not usually considered very ornamental objects in the landscape, but when placed around plantations the effect is different, as the trees with their foliage counteract the monotony exhibited by the lines of stone walls, and form rather a striking contrast. The cost of building depends upon the cost of labour in procuring the stone, the distance from which

STONE DYKE FENCE,

About 5 feet high at 700 feet altitude; north and north-east exposure (Fyling Hall Estate).



PLAN OF A TURF AND SOIL DYKE.

it has to be carted, and the manner in which it is constructed.

When built by a rough hand, with stones of all shapes and sizes loosely and roughly laid together, the cost is not great in building, but as such careless work as this soon gets out of repair, the cost of maintenance is greater than when properly built.

When built with good shapely stones by an experienced man, and the material laid ready to hand, on the following plan, the cost would be from 1s. 6d. to 2s. per yard run, viz. :—Base of stone dyke 2 feet wide, tapering up to 16 inches wide at the top, with coping stones well fitted and embedded in mortar ; from 3 feet 6 inches to 4 feet 6 inches in height, to which must be added the cost of procuring and cartage. At first sight this appears rather expensive, but when well constructed it is most durable.

Turf Dyke

Turf dykes might be found useful in a few cases, but owing to the temporary character of the material employed they would be rather expensive to maintain in repair. They are subject to damage by cattle running over them, and to rabbits burrowing into them, and unless they are protected from these in some way, this method

of protection would prove rather a costly affair. They are also subject to constant washing down by rains. They are sometimes planted for the purposes of affording shelter to grounds used for raising and transplanting nursery stock.

Turf dykes are built either of turfs alone or of turfs and soil; the latter makes by far the most solid construction, and fewer turfs are required in the building. This is an advantage, as one great objection to turf dykes is the quantity of turfs used in their construction. These turfs are generally cut from each side of the dyke, and they could be turned to much better account by making use of them in the preparation of the soil for planting.

A turf dyke can be constructed on the following plan, of which diagram No. 9 is given as an illustration :—Mark out the base upon which to build the turf dyke, which must not be disturbed by the spade, 3 feet 6 inches in width, cut the turfs to be used in the building about a foot square, and from 3 to 4 inches in thickness, according to the character of the soil and the depth to which the fibrous roots in quantity are found, as these roots hold the soil particles together. Lay two rows of turfs along the outer lines of base, and build up as shown in the diagram (No. 9), filling up the centre with soil (the whole should be firmly beaten down as the work proceeds), with slanting sides to

the height of about 30 inches and one foot wide at the top; the top turfs bind the whole together. As soon as the dyke is built, beat the sides in with the back of a spade, or a beater specially constructed for this purpose. The turfs may be cut from the sides, as shown in the diagram, or brought from another place, as may be arranged.

Stones and Soil

Fences of similar construction to those of turf dykes, and of the same shape and dimensions, but of a more permanent character, may be built of large stones laid up the sides and firmly embedded in the soil. In this way a sort of rockwork is formed, which, if thickly planted with some hardy shrubs of dwarf growth or which can be kept cut like a hedge, would form a most effective first break to the winds. Many pieces of ground in bleak positions could be sheltered in some such simple way as this, especially on pleasure grounds, on exposed sides of shrubberies and similar places, where, if neatly or artistically constructed, it would serve the double purpose of shelter and ornamental design. It might happen that one side only would need to be built up with stones, and the ground on the other side might be raised with good soil, so as to slope from the top of the upper layer of stones away from the

winds, and the whole thickly planted with trees and shrubs.

In fences of the above description turfs need not be used in the construction but simply stones and soil, and if the latter is rich in character, some of the hardiest plants would thrive in it.

Spar and Brushwood

Fences of this description, although not of a permanent nature as compared with stone dykes, are among the most useful which can be devised for surrounding clumps of newly planted trees in positions of exposure. Where timber is plentiful and can be cheaply worked, fences are also inexpensive to erect.

They can be erected in various ways; the following, which is similar to that shown in illustration No. 10, may serve as an example of one of them.

Posts of rough oak or larch, as being among the most durable of English-grown timber, are let deeply into the ground about five feet apart, either by digging holes, or, if the ground is soft or sandy, they may be driven down with a heavy mallet into holes previously made with a crowbar. Two cross rails are nailed from post to post on the outer sides, their ends being let into the posts, the bottom one from 10 to 12 inches from

the ground, the upper one about 10 inches from the tops of the uprights. The upright spars, which can be made of rough larch poles, the trimmings or thinnings of plantations, either whole or sawn in halves with a circular saw, are nailed on from 9 inches to one foot apart. The height of fence may be from 3 feet 6 inches to 5 feet or even more. Brushwood trimmings from trees or hedgerows are then interwoven between the upright spars. It may be necessary to run wire-netting round the whole, inside the fence, to keep out the rabbits. Grass and other herbage will grow up through the wire-netting and brushwood, and all combined make an excellent fence, which serves the double purpose of protection against stock and rabbits and shelter for the young trees.

Cheaper fences may be constructed of rough stakes and the trimmings from trees in plantations. These are driven firmly into the ground, from 9 inches to one foot apart, and brushwood interwoven between. Cross rails nailed near the top serve to strengthen and keep them steady and upright. Fences of similar construction to those described above may be seen in illustrations Nos. 7 and 10. Stakes of willow in some places when driven into the ground will strike root, and when the young branches as they grow are interwoven between them, they make useful fences to serve as shelter.

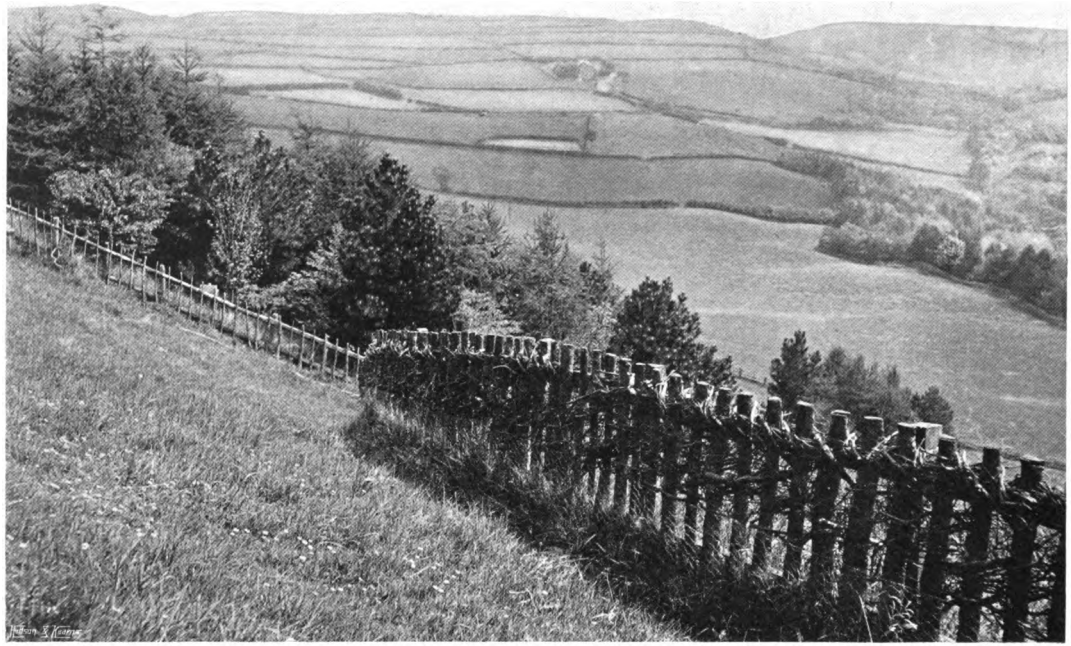
Board or Paling

Although not permanent in character, as compared with walls built of brick or stone, or stone dykes, boarded fences or palings form useful shelter to trees for some considerable time, when the more durable kinds of wood are used. It is not necessary to go into minute details to show how fences made of boards or palings are constructed, as this has been already treated upon when describing the erection of spar and brushwood fences, which are similar in character.

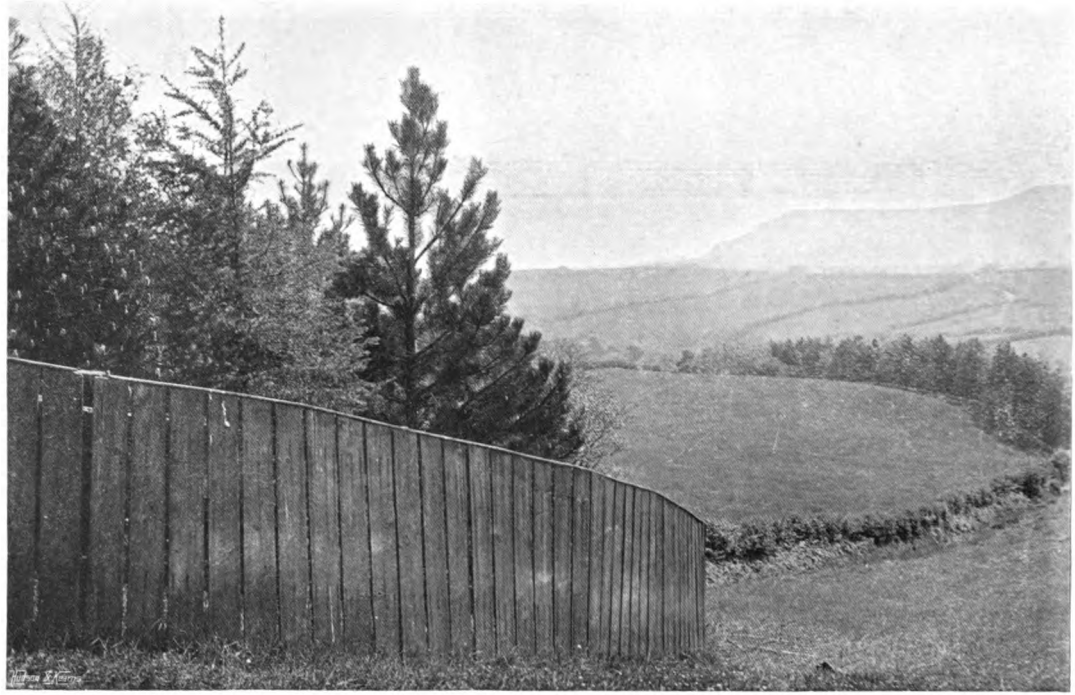
The illustration No. 11 shows a boarded fence, 3 feet 6 inches in height; the boards, which are the white wood of spruce, 6 inches wide and ½ an inch in thickness, are nailed on to the cross rails, one inch apart, which is sufficient to keep out the rabbits and protect the trees from stock. Along the top a strip of wood is nailed to keep the boards from warping; the posts are alternate oak and larch. This fence surrounds a clump of trees consisting of permanent Oak, with Larch and Austrian Pine as nurses. On the northern side are some Wych Elm, Service trees, and White Beam.

Hedge

In these chapters a distinction has been made between the two words "fence" and "hedge." A



SPAR AND BRUSHWOOD FENCES (FYLING HALL ESTATE).



BOARDED FENCE SURROUNDING A CLUMP OF TREES (FYLING HALL ESTATE).

hedge composed of living plants is also rightly called a fence, and is known as such, although it is commonly called a hedge; but for the sake of simplicity it has been thought advisable to use the word "fence" in every case when referring to those constructed with solid material, such as stone, brick, wood, and turf, and to reserve the word "hedge" to others composed of living plants of some species or another.

In the plan (diagram No .6) the two are advised to be placed together in the first line of exposure. The fence of more solid construction on the outer side, directly facing the elements, the hedge on the inner side of the fence and running directly parallel with it.

When a hedge is put up without the fence, the first line of shelter is not so effectual, as a hedge grows slowly, becomes stunted, and will not reach to any good height in such positions. But if such is attempted, it would be advisable not to depend upon a single line of hedge plants alone, but also to plant some of the hardiest species of trees (see Chap. VI. p. 52) very thickly for some little distance inside the enclosure on its most exposed side.

CHAPTER IV

PLANTING TREES AND SHRUBS

THERE are various matters of detail in connection with seaside planting which will now be considered, viz. (1) Preparation of the soil; (2) Planting seasons: (*a*) deciduous trees; (*b*) evergreens; (3) Selection of stock; (4) Planting; (5) After-treatment.

PREPARATION OF THE SOIL

A thorough preparation of the soil is another most important factor in the successful cultivation of trees and shrubs, and this applies most particularly to those which are to be planted in the first line of exposure.

Owing to the difficulties which have to be contended with, it is absolutely necessary that good cultural conditions should be secured; everything should be done to encourage the young trees to make a good start, and to secure subsequent rapid and healthy growth, to lay a good foundation, so

AUSTRIAN PINES,

Cedrus atlantica, Silver Poplars, Willows, Alders, etc. Tennis Court; north and east exposure (Belvedere Estate).

that when the tops rise above the sheltered lines of fences and hedges they are better able to withstand adverse influences.

Soil preparation in all its various phases embraces a wide and extensive range of thought and of detail which cannot be fully treated upon here. The reader who seeks to acquire a further knowledge of this subject is advised to study the numerous works of competent authorities on soils, horticulture, agriculture, and forestry. A few only of the main points will be cursorily dealt with.

In the first place, a thorough and complete drainage system should be carried out, and there are few soils but what will require some little attention in this way.

A good system of land drainage adds to the available depth of soil, giving to the trees a firmer roothold and opportunities of developing their subterranean parts; and increases the productive capacity of the soil, the effects of which cause a healthier and more luxuriant growth of stem, branches, and foliage.

When drain pipes are laid in the soil in which trees are afterwards planted, they become after a time filled with their roots and rendered ineffective; this is especially the case with the Ash and some other species of trees. An open system of drainage is a good one to follow, where it can be done.

On the slopes of hills, where the water percolates, or springs rise up through the soil, causing stagnation of the land, or in other water-logged soils, open drains or ditches secure good drainage, or in low-lying marshy districts where the surface water can be drained off or led away.

Following the completion of the drainage, the land should be well and deeply worked. The method of working would depend mainly upon two conditions: (1) the depth and character of the soil and subsoil; (2) its area.

Soil and subsoil vary much in character and depth, and the conditions applicable to working small pieces of ground would not be the same as those applying to large tracts of country where it is desired to plant extensively. On small areas the ground may be trenched, and the method known as "bastard trenching" is the best to follow. This could be carried out when the soil is of sufficient depth, and the character of the subsoil is such as to allow of its being done; but in very large areas this would not be found to be an economical plan to follow. The next best method is to thoroughly work the land with the plough and other agricultural implements, breaking it up as deeply as the nature of the soil will allow, and bringing it into proper conditions for planting.

It is a good plan to prepare the soil in

the manner above described during the winter months; to heavily manure it with farmyard manure, and grow some farm or garden crop upon it in the next summer, this to be followed up by the planting of the trees in their proper seasons. This allows of time for soil settlement, particularly where trenching has been done, and also for a thorough cleaning of the land by cultivation before the young trees are planted.

Where it is desired to plant single trees for growing into large specimens, or to make shrubberies in gardens, it may be necessary to undertake special soil preparation, as strong, healthy, luxuriant growth is of the first importance. Under such circumstances the expense of working is only a secondary consideration.

As this applies to villa gardens, as well as to those of larger extent, it will not be out of place to convey a word of caution to those who propose to erect dwellings with garden surroundings. Sometimes when the foundations for the buildings are dug out, particularly for cellars or rooms more or less underground, the subsoil is spread on the ground over the good soil, where it is intended to lay out the garden. This is a great mistake. Subsoils often contain substances injurious to the roots of garden plants, and for this and other reasons they will not thrive in it, many often dying. The foundation subsoil

should therefore be carted quite away to places where it will not cause mischief.

Planting Seasons

Deciduous Trees.—Under general conditions, all kinds of deciduous trees and shrubs may be planted at any time from the end of October to the end of February and sometimes later, weather and soil conditions being suitable. But when it is desired to plant trees in very exposed places, as on the eastern coast, it would be advisable to defer it till late winter or early spring, as the young trees, having been possibly selected from nursery beds where they were growing close together, would suffer much from removal to such exposed positions, where they would have to pass the first winter after having been transplanted.

The later planting would also retard early spring growth, thus giving the young shoots a better chance of escaping injury from cold winds and frosts in spring. When once established, the plants would have a whole growing season before them, and be better able to adapt themselves to the new conditions. Autumn or early winter planting may be carried on in the more sheltered spots, such as close under fences, buildings,

or in the hollows, or in any place where the young trees can be well protected.

Evergreens.—The conditions which influence the removal and transplanting of evergreen trees and shrubs are quite different from those affecting deciduous trees, and this applies particularly to removals from nursery-beds to open, bleak positions. The disadvantages attending the removal of evergreens to places where they are subject at once to keen, cutting winds is soon evident by the injury done to the foliage, and is a matter of common observation. In fact, many die from this cause alone.

Evergreens should not be transplanted until late in spring unless they are to be well sheltered, and even then the month of April is quite early enough. The more tender species, or those which remove badly, transplant best even later than this.

Some authorities actually advise the planting of some kinds of evergreens, such as large hollies, in June, and there is no doubt, if they are well attended to, by shading the trees from the hot sun, mulching and watering the soil about their roots, and constantly syringing the foliage for a few weeks, they stand a much better chance of establishing themselves than when planted earlier in the year.

September planting is also advised by many

practical men, and may be done inland; but late spring or early summer would be the best seasons for exposed situations on the coast.

Both evergreen and deciduous trees and shrubs, however hardy they may be, should be given some sort of shelter when newly planted by the sea; this applies particularly to evergreens, even the hardiest kinds.

Selection of Stock

When selecting young trees from the nursery grounds for planting in clumps or belts, it is best to make choice of those which have been transplanted from the seed-bed in the previous year, in preference to those drawn directly from the seed-bed. Transplanted stock are larger, stronger, and more fibrous rooted, and establish themselves more quickly, and are thus better able to contend with the adverse conditions attending growth by the seaside than young seedlings. Only the strongest and best should be selected; the weaker plants may be again transplanted into nursery-beds for removal to permanent quarters later on.

As young seedlings of the commoner species of trees can be procured from nurserymen at very cheap rates, it would scarcely pay the planter to raise stock from seed unless it is intended to

plant trees in large quantities, to cover extensive areas, and even then it becomes a question whether, considering the cost entailed in the erection of fencing, raising of stock, the constant care and attention required, it would not be more economical in the end to buy seedlings and transplant them into nursery-beds, or even to buy at once the transplanted stock.

When planting a small piece of land it is certainly the best plan to procure transplanted stock, particularly noticing that the young trees are of clean, healthy growth and exhibit no signs of disease or injurious insects. The young trees may be sent in bundles, and must be unpacked directly after arrival. Should it be found impossible to plant at once, straight trenches should be dug, large enough to take in all the roots, and the young trees laid thinly out along the trenches, their roots covered with soil, and the ground covered with bracken or other protective material in case of severe frost.

Planting

When the planting season arrives the young trees should be carefully examined, their roots trimmed, and any broken or bruised roots and branches cut neatly off with a sharp knife.

If the soil is not in a workable condition owing

to previous wet weather, it is best to wait for a time, if this is possible, until it dries sufficiently. Planting operations must never be carried on during frosty weather or when there is any danger of burying lumps of frozen soil.

Holes are dug in the ground for each tree, wide and deep enough to take in all its roots; the roots should be carefully laid out with fine soil placed among them, and the whole firmly trodden down, taking care to leave the stems perfectly upright. For some of the larger specimens stakes might be required to keep them steady.

In certain cases where the soil is poor, some of a richer character might with advantage be used among the roots when planting.

After-Treatment

This would consist in keeping the ground clear of weeds for a few years, cutting out dead branches, the removal of dead and diseased trees, and the planting of others in their places. During the first summer if it is a dry season it may be necessary to water the young trees to keep them growing, or many may die, especially if the drought is severe.

Attention should be given to spraying with insecticides or fungicides in cases of infestation

by insects or disease, and to other cultural details which may from time to time be necessary in order to secure healthy growth. Thinning also might be advisable as the trees develop —especially in the more sheltered places.

CHAPTER V

SOME LOCAL FEATURES

MANY hints on seaside arboriculture in exposed situations may be gathered from what has already been done with varying success along the Yorkshire coast. Several resident gentlemen, as previously stated, have taken a deep interest in this matter, and results as shown upon their estates prove that seaside planting can be successfully carried out when skill, energy, and forethought have been brought to bear upon their efforts. A few notes taken from some of these places are given below as examples :—

SCARBOROUGH IN MAY

It is only in the more southern parts of this town where trees and shrubs in quantity are to be found growing. To a certain extent, Castle Hill on its northern side shelters the bay and portions of land along the South Cliffs. On the South

Cliffs, starting from the Foreshore in front of the People's Palace and Aquarium, where it is fairly well sheltered from the north by the hills and town buildings, the principal trees and shrubs noticed are: Privet, the foliage of which is very much cut up by the winds on its seaward side; Broad-leaved Holly, healthy and fine; Common Elder, very much cut up; *Olearia Haastii*, with little signs of injury, proving its extreme hardiness as a sea-side plant; and Sycamore, which is in excellent condition.

The portion of the town to the west, passing from the sea under the Valley Bridge, is beautifully wooded. The trees nearest the sea, which are mostly Elm and Sycamore, are rather stunted in growth, but farther inland the others sheltered by these gradually become more luxuriant. Upon the steep slopes on the cliffs southwards, in full exposure to the north and north-east winds, are some stunted Sycamores and Willows; here the disadvantages attending thin planting are plainly in evidence. At the higher altitudes the benefits attending shelter afforded by trees growing thickly, upon others beyond, are particularly noticeable, those in full exposure to the north and north-east being more or less stunted in growth, while the others which they shelter are larger and healthier specimens. Lower down, a Copper Beech shows a struggling existence, its dark

foliage, although sparse, being conspicuous in the distance.

The Spa Gardens, which are mostly sheltered by buildings, slopes, and terraces, are very ornamental. Several species of shrubs, as Euonymus, Broad-leaved Holly, Barberry, *Olearia Haastii*, and others, succeed well.

Farther southwards the trees, where in full exposure, show a more stunted growth, especially where thinly scattered on the face of the cliff.

In front of the Esplanade, in a bay, the advantages attending thicker planting are evident, added to which a great many of the trees are lopped from time to time, causing them to grow still more thickly. In this instance, the primary object of lopping has evidently been to obtain an unobstructed view of the sea from the houses. Broad-leaved or Wych Elm and Sycamore are prominent here. Some young Austrian Pines have lately been planted, but their foliage is much cut up.

On the tops of the cliffs, by the road, a luxuriant growth of *Olearia Haastii*, as an edging on the most exposed sides of a bed of Golden Euonymus, again clearly shows how very hardy this shrub is near the sea.

In Holbeck Gardens, Privet hedges nearest the sea are protected by boards about two feet high. In the most exposed places, Olearia, Hollies, and

Euonymus are present in abundance; *Rosa rugosa* (Japanese Rose) bears the winds well, proving it to be one of the hardiest of seaside plants.

In the more sheltered parts, protected by a high boarded fence, with a Privet hedge on its inner side, Hollies, Berberis, Euonymus, some Aucubas, *Prunus Pissardii* do well. Veronicas also are good here.

The Belvedere House Estate, South Cliffs, Scarborough

The gardens and grounds at Belvedere House comprise about thirteen acres of land, and are situated on a steep incline, rising from the beach up the face of the cliffs to about 200 feet altitude.

Mr. George L. Beeforth, the residential proprietor, has for a good number of years taken a deep interest in planting trees and shrubs up the cliffs on his land, and the splendid results achieved constitute fine examples of what can be done in seaside planting. The photographic views taken at this place are very fine, and show the remarkable luxuriance of the trees and shrubs and the beauty of the garden.

That the grounds at Belvedere are in a very exposed situation may be gathered from the follow-

ing extracts taken from one of Mr. Beeforth's letters, dated July 9, 1903, as follows:—

"I have added a few notes to the MS. sent, which I now beg to return. I think you have a fairly good list of what will grow at the seaside. The cutting winds we have here are far worse than the cold. Shelter is wanted from the west and north-east more than from any other quarter. The winds from the west are more harmful than those from the north-east, simply because the west winds last two-fifths of the year, whereas the north-east is very rare; but when it does come it is the most destructive of any. The south-east is quite as bad, but only visits us a few days in the year. It is bad because it becomes laden with a sandy moisture which is deposited on the leaves of plants, then corroding and shrivelling them up. The direct east wind is generally a steady wind, with no great force, and accompanied with sunlight and clear atmosphere, so it need not be dreaded so much as the north-west, north-east, and south-east.

"I believe, with proper shelter for a while, trees planted thickly on large belts or clumps will grow anywhere on the Yorkshire coast. Manuring trees (which is rarely done) must add materially to their vigour, but I have never been able to get a gardener to do it systematically: he looks upon it as a 'fad of his master.' You will do a great

service if you can further planting on the English coast of suitable trees and shrubs. It would improve the climate, and the roots of trees tend to prevent the coast from washing away."

A fine collection is growing here, among which are included some of the rarer species of Conifers, other evergreens and deciduous trees and shrubs. Each of the rarer kinds, when newly planted and until it reaches a good size, is sheltered on the most exposed sides by two boards nailed together at right angles. One of the features of the place consists of two fine hedges of *Escallonia macrantha* on each side of a walk, both upwards of 100 yards long and several feet high, arranged in clumps and bays, with rose-beds in each of the latter.

The hedge on the seaward side is protected from the sea by a close boarded fence reaching to the top and backed up with Austrian Pines; the latter, however, have grown up since the Escallonia reached its present full height.

In a sheltered spot is a small nursery ground set apart for the propagation and raising of trees, shrubs, and other garden plants. Euonymus in quantity is growing under trees and in open places all over the grounds. Mr. Beeforth considers this one of the hardiest of evergreen seaside shrubs, even much hardier than the Privet. It was recommended to him as a seaside plant,

in the first instance, by the late Sir Joseph Paxton.

Clumps of Austrian Pines grow well in full exposure to the sea; the Austrian Pine and the Deodar Cedar, Mr. Beeforth says, are the two hardiest evergreen trees for the coast. In a well-sheltered but otherwise open spot are numbers of large rose-beds, each bed being filled with its own particular variety; these flower profusely in their proper seasons.

A substantially well-built summer-house facing south, with a medlar and a walnut tree in front, another rose garden in the hollow, and a fine view of the sea through the trees, with their dense masses of foliage showing innumerable shades of green colouring, is a most comfortable place in which to sit. Upon the slopes on the banks, and under the trees almost everywhere, wild flowers are allowed to grow undisturbed. In a quiet nook quite hidden from observation, and which a stranger can hardly discover, is a strawberry-bed surrounded by about forty or fifty bush apple trees, which look attractive when in flower, although fine fruit of good quality can hardly be expected in such a position.

It would be impossible to give a full description of each of the varieties of trees and shrubs, as they are too numerous, but sufficient has been said to show how places by the seaside can be

IN THE GARDENS, BELVEDERE HOUSE

Large trees, Sycamore and Wych Elm. Smaller plants, Lombardy Poplar, Veronica, Lord Penzance Briars, etc.
Looking south towards Filey Brig.

BEECH AND OTHER TREES NEAR A QUARRY ON THE FYLING HALL ESTATE.

improved and beautified. Mr. Beeforth is to be highly complimented on his success in seaside planting, and this example should prove a strong incentive to others.

Fyling Hall Estate

Fyling Hall, the residence of Mr. John Warren Barry, is situate about one mile as the crow flies from the sea at Robin Hood's Bay. The estate comprises some 700 acres of land, which is now extensively wooded, and affords another splendid example of successful arboriculture near to the eastern coast.

The conditions affecting the planting and growth of trees are not quite the same as those on the Belvedere estate, as the former is a short distance from the sea, whereas the latter is upon the steep cliffs. Most parts of it which have now been planted up were previously very bleak, some portions, being at high altitudes, are exposed to strong gales and keen, cutting winds from the sea, and from every other point of the compass.

For upwards of thirty years Mr. Barry has been planting largely on his estate, and consequently has gained a sound practical knowledge of planting by the seaside and in exposed situations. He has also studied forestry under other conditions at home and abroad, so that he may

fairly claim to be an authority upon such matters, and, like Mr. Beeforth, he is only too glad to impart his knowledge to others.

The gardens and grounds around the mansion are laid out in terraces, shrubberies, and plantations, and contain many fine specimens, including some of the rarer kinds of trees and shrubs, a few of which are shown in the photographs taken on the estate.

Escallonia macrantha is represented here as a hedge and trained in arches. Irish Yews, Euonymus, Aucuba, Common Laurel, Portugal Laurel, Hollies, Box, Bays, Arbutus, Rhododendrons, *Garrya elliptica*, Cotoneaster, *Veronica decussata* (which is a fine sight in August), and Fuchsia (clumps of several years standing over 6 feet high) all grow luxuriantly. Precautions have been taken when arranging for planting that the hardiest species of trees are placed in such a way that shelter is afforded to the more tender kinds. Dogwood as undergrowth in strong soil outgrows everything and is being rooted out; Willows grow tall and blow down, so these are gradually being worked out.

In the plantations such timber trees as Oak, Ash, Sycamore, Elm, Larch, and other Conifers are well represented. Among the other Coniferæ I noticed some luxuriant young trees, 20 to 30 or more feet in height, of *Pinus insignis*, *P. Laricio*,

P. austriaca, P. sylvestris (Scotch Fir), *Abies nobilis*, and Douglas Fir, while a row of *Araucaria imbricata* is magnificent, the stems being well furnished with branches close to the ground. Scotch Laburnum, at an elevation of 700 feet, proves itself to be one of the hardiest trees in exposure. Spanish Chestnut succeeds well in the ravines.

As the land upon the estate varies much in altitude, and the hills slope to all points of the compass, and as the soil and subsoil also vary much in character, ranging from light to heavy, shallow to deep, the difficulties of selection of suitable kinds of trees to meet each particular soil and aspect are increased.

Mulgrave

The extensive plantations and magnificent woodland scenery on the Mulgrave estate, the residence of the Marquis and Marchioness of Normanby, are well known to the residents of Whitby and its neighbourhood, as well as to the numerous summer visitors who frequent these parts, and whose delight it is to avail themselves of the many opportunities afforded them by the kind permission of its noble owner to walk through the park and woods. The pleasure grounds, park, and plantations abound in remark-

ably fine specimens of timber trees in variety, of great height and girth. That portion of the estate from which the photographs have been taken affords good illustrations, as showing the effects of exposure and shelter.

Going up the road from Sand's End to Lythe a belt of trees is seen on the right, on the top and sides of a hill, which shows a rather stunted growth, the tops of the trees growing away from the strong winds.

On the other side of the road in the park are some clumps of trees which are much taller, straighter, and growing into nice timber, the results of shelter afforded by the rising ground and trees opposite. Higher up the road, on the left, is another belt of trees which it is interesting and instructive to notice, as showing the different degrees of hardiness of various species, and again the effects of shelter and exposure. One instance is given, viz., the Larch has proved to be of little value as a seaside tree when in full exposure in these parts. As soon as the tops of these trees reach to the strong gales they at once become stunted in growth, and bend away from the blast, producing very poor timber where they cannot grow to any great height. There is also abundant evidence of this in other places where Larch is growing under similar conditions. Many other interesting points might be noted,

A VIEW OF THE SEA FROM THE PARK AT MULGRAVE.

but sufficient has been said, and a visit to Mulgrave will emphasise the fact that even fine timber may be grown near to the sea.

Saltburn

Not much planting has as yet been attempted on the cliffs at Saltburn, but a walk round the outside of the grounds of a residence known as "The Cottage" affords some interesting study. *Lycium barbarum* flourishes here on the tops of the cliffs, right in the teeth of the keenest winds from the north-west, round by east to south-east, abundantly proving its extreme hardiness by the sea.

There are numerous allotments in this part of Yorkshire which are much exposed, and crops suffer greatly in consequence. Some of the holders put up fences of different kinds, which serve their purpose well, but as *Lycium barbarum* is a plant which flourishes by the sea, and is of easy culture, it might be employed as a screen from the winds in positions of exposure among these allotments.

The Sycamore here holds its own as one of the hardiest trees; although the foliage is sometimes cut up by the winds it soon recovers. It is also to be noted that the trees in the

most exposed places are very stunted in growth, but they fulfil their part well in protecting others beyond. The Elders, both Golden and Green, are much cut up here in spring; Goat Willow flourishes; Privet only grows in partial shelter.

CHAPTER VI

SPECIAL LISTS OF TREES AND SHRUBS

In this chapter an attempt is made to give some special lists of trees and shrubs which may be found useful in planting by the seaside, in accordance with the plan of this work. With the exception of the list of roses, the name of each species and variety mentioned will also be found in Chapter VII. in its proper place in the alphabetical arrangement, where some further information is afforded in each case. This part of the subject will be arranged under the following heads, viz. (1) Hardiest species of trees and shrubs: (*a*) for planting in the first line of exposure, (*b*) as scrub on the cliffs; (2) Hedge plants: (*a*) deciduous, (*b*) evergreen, (*c*) in mixture; (3) Undergrowth: (*a*) evergreen, (*b*) deciduous; (4) Roses: (*a*) Teas, (*b*) Hybrid Teas, (*c*) Hybrid Perpetuals, (*d*) Noisette.

Hardiest Species of Trees and Shrubs

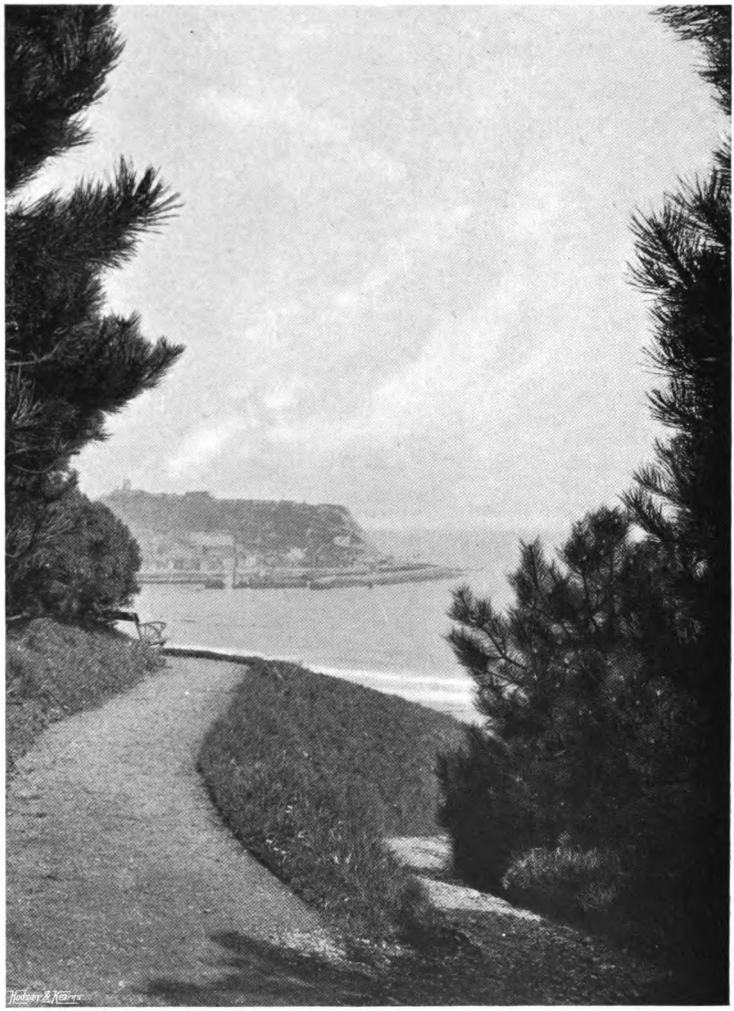
A proper selection of suitable trees and

shrubs for planting by the seaside has been one of the greatest difficulties to contend with. Trees and shrubs which are called "hardy" in catalogues come to us from many parts of the world. In their native habitats these are found growing under many diverse conditions with respect to soil, climate, altitude, etc., and which in many instances can hardly be duplicated in this country. It is no wonder, then, that difficulties arise, particularly under such conditions as are found in many parts of the British coast.

Mistakes, therefore, are easily made, especially when the planter has not had the advantages of a long experience in seaside arboriculture. A part of the plan of this work has been to endeavour to mention those species of trees and shrubs which, from careful observation, have proved to be the hardiest, and which stand best in the very teeth of the winds on the Yorkshire coast. When arranging for planting, these must take their proper places in what is called here "the first line of exposure." They may be classed as follows:—(*a*) for planting in the first line of exposure, and (*b*) as scrub on the cliffs.

For planting in the first line of exposure.—The Common Sycamore, Scotch or Wych Elm, Common Ash, and English Oak, among deciduous trees, are to the front as the hardiest and best species for planting in the most exposed

A SYCAMORE IN EXPOSURE, AND GARDEN PLANTS (BELVEDERE ESTATE).



AUSTRIAN PINES, NORTH-EAST EXPOSURE (BELVEDERE ESTATE).

positions; and the Austrian Pine among the evergreens. All the above can be procured at cheap rates from nurserymen, and as they are also among the most inexpensive of trees to buy in quantity, this adds greatly to their value for planting. In such exposed positions as these, the trees cannot be expected to produce fine timber, but for the purpose of shelter they are invaluable. The Deodar Cedar is considered by Mr. Beeforth to be as hardy as the Austrian Pine as an evergreen tree for the coast; but it is more expensive to buy. It is, however, well worthy of note.

Deciduous trees are preferable to Conifers for growing in clumps or belts in the first line of exposure, as they retain their lower branches for all time where they can get sufficient air; but Conifers, such as Austrian Pines, mostly lose them as the trees get old and the cold winds draw through the clumps or belts under their tops, so that little shelter is afforded beyond.

When both deciduous and evergreen trees are arranged in mixture, in clumps or belts, proper regard should be paid to the growth of each species, so that all should be placed in such a manner that the aggregate result of the whole combined should be an effectual break to the winds on the first line of exposure for all time.

It would be advisable to make special note

of the species of trees above mentioned, and to depend on these largely, as being the most suitable in every way for planting in positions of keen exposure; also noting other information with respect to soils suitable to each species (as this is most important), and other cultural details which may be found in Chapter VII. under the names of each species and variety.

It is not necessary to make long lists, but there are other species, some of which have been noticed on the coast and are included in that given below, which are also amongst the hardiest for planting in the most exposed places, and which may be used in mixture for belts, plantations, shrubberies, or other places, as may be desired. These are given as follows, viz. :—

Evergreen.—Broad-leaved Holly, *Cedrus atlantica*, *Euonymus latifolius* vars., Olearia, Privet (Broad-leaved), *Veronica spicata* vars.

Deciduous.—Alder, Blackthorn, Dogwood, Goat Willow, Hawthorn, Hornbeam, *Lycium barbarum*, Mountain Ash, Poplars in variety, Scotch Laburnum, Sea Buckthorn, White Beam, Wild Cherry, Wild Crab, Wild Pear, Willows in variety.

As scrub on the cliffs.—The word "scrub" is intended to mean "those plants which grow upon the cliffs by the sea, and which in such positions only make short, dense, bushy growths."

The following species may be used for this

purpose, viz. Alder, Ash, Dog Rose, Goat Willow, Gorse in places, *Lycium barbarum*, Oak, Sea Buckthorn, Silver Poplar, Sycamore, Willows in variety, Wych Elm.

Some of the above, as the Willows, Sea Buckthorn, Alders, *Lycium barbarum*, and others, may be planted very thickly, and their branches as they grow layered in the soil along the face of the cliff, where they will strike root freely, and will, under certain conditions, as previously stated, help materially in checking erosion.

Hedge Plants

A few brief notes on various hedge plants, each species of which will also be found in Chapter VII., may be useful.

Deciduous.—Common Hawthorn (*Quick*). This is without doubt the most useful hedge-plant in common use in this country. It is especially good on strong soils; makes a short, stunted growth in keen exposure near the sea.

Common Beech is not altogether suitable as a hedge plant in full exposure to the sea on the eastern coast; but inland, even in the most exposed situations, it answers this purpose well. It is especially good on light, dry, deep soils over limestone. It is often used as a hedge plant to enclose

nursery grounds and gardens, and as it retains its dead leaves through the winter months, and only loses them in spring as growth begins, it affords good shelter at all seasons of the year.

Common Hornbeam is also good as a hedge plant, and will succeed in strong soils where beech does not thrive.

Myrobella makes a stiff, strong hedge, but often goes hollow at the bottom, unless special care is exercised in training the young plants as they grow in height, and encouraging them by cutting hard back each year when young, and until they reach their full height, to form dense bottom growth, and keeping the hedge constantly trimmed afterwards. On strong soils it grows very rampant—perhaps too much so. On rather poor soils it is weaker and makes better fences.

Prunus Pissardii. A good hedge of this is to be seen in a villa garden in Thorpe, near Robin Hood's Bay. It makes a very pretty hedge in spring, summer, and autumn, with its dark coloured foliage. It also appears to be fairly hardy in this position.

Lycium barbarum has already been noted as hardy in exposure by the sea, and is much used as a hedge plant inland (see Chap. V. : Saltburn).

Evergreen.—Oval-leaved Privet makes a thick hedge when kept in good order. It is of rather weakly growth, and is liable to get blown about

by the strong winds, especially if it is top-heavy. To prevent this, some strong iron rods reaching nearly to the top, and driven in at equal distances all along the hedge, to which is fastened a thick piece of strong galvanised wire, strained tightly within a few inches of the top, will help to keep the hedge steady and straight. The Oval-leaved Privet makes a better hedge than the common species.

Euonymus japonicus should be largely used as a hedge plant by the seaside. Along the southern and western coasts it makes fine hedges. It has also been noted as answering this purpose well along the eastern coast.

Common Holly, under shelter by the sea and inland, makes a thick, impenetrable, ornamental hedge, but is of rather slow ingrowth, taking several years to develop well. Young plants should always be used in planting, as hollies do not transplant well when of large size. If such are used, the losses might be heavy when planting a hedge of any great length.

Common Yew makes a dense ornamental hedge and will live to a great age. It is often seen in pleasure grounds, and should not be used where cattle can reach it, as it is dangerous for them to eat of its branches and leaves.

Common Laurel makes a fair hedge in gardens. It should always be kept pruned with a knife to

keep the leaves which remain upon it sound and whole.

Portugal Laurel is sometimes used, but is not quite so good a hedge as Common Laurel.

Common Box makes a dense hedge, and on dry, deep soils may be found very useful.

Escallonia macrantha under shelter by the sea makes a splendid ornamental hedge.

Mixed Hedges.—Quickthorn and Beech in mixture make a nice hedge, and give colour in the landscape in summer with their different shades of green, and in winter with the brown leaves of the Beech mixed with the bare branches of the Thorn.

Myrobella and Privet together make a very useful hedge. The Privet being of a dense habit of growth, especially when kept clipped, will thicken up the hedge, more particularly along the bottom, where it is required, as the Myrobella often goes hollow below.

Myrobella and Prunus Pissardii. A few plants of the latter intermixed at intervals with the Myrobella make a very pretty effect.

Beech and Holly. A mixture of these two plants is admired by some people; it looks very well in winter, with the brown leaves of the Beech intermixed with the dark green of the Holly.

Amongst other hedge plants often found in mixture may be mentioned—Blackthorn, Wild

Rose, Maple, Dogwood, Wild Crab, Birch, and Spindle Tree.

Undergrowth

Undergrowth or underwood is understood to represent "certain kinds of trees and shrubs which succeed under and are shaded by other trees of taller habit." In coppices, woods, and plantations it serves many useful purposes. Undergrowth does not succeed well under Conifers or tall-growing evergreens, owing to the exclusion of the necessary light and air caused by the dense canopy of foliage formed by the trees above. In mixed shrubberies of deciduous and evergreen trees and shrubs, the dwarfer species should be planted where the taller evergreens cannot overgrow them. In the first line of exposure it is desirable not to plant evergreens for undergrowth, as even the stronger-growing deciduous trees, which are recommended to be planted very thickly, would not grow very tall, and there would be no room for them.

The following list of trees and shrubs suitable for undergrowth may be found useful. These are not intended for the planting of coppices.

Evergreen. — American Arbor-vitæ, *Aucuba japonica*, Bay, Box, Broom, Butcher's Broom, Cotoneaster vars., *Escallonia macrantha*, *Euony-*

mus japonicus, *Griselinia littoralis*, Hemlock, Spruce, Holly, Ivy, Juniper, Laurel, Laurestinus, *Mahonia Aquifolium*, Privet, Rhododendrons.

Deciduous.—Diervilla, Dogwood, Elder, Guelder Rose, Hazel, Hornbeam, Mock Orange, Sea Buckthorn, Snowberry, Spindle Tree, Spiræas (bushy).

Roses

As roses are a speciality at Belvedere House, the following is given as a selection of some of the most useful sorts for the seaside. Fuller particulars of each will be found in Rose-growers' catalogues.

Teas.—Gloire de Dijon; Mme. Bravy, similar to Gloire de Dijon; Homère, a grand bed, flowers freely. *Hybrid Teas.*—Bessie Brown; Captain Christy, robust grower; Gloire Lyonnaise, splendid, by far the best white for the seaside; Mrs. J. W. Grant; La France, very hardy; Liberty, a brilliant scarlet; Marquise de Litta, grows luxuriantly; Papa Gontier, a good rose. *Hybrid Perpetuals.*—A. K. Williams; Boule de Niege, good white, but cannot compare with Gloire Lyonnaise; Baroness Rothschild, very hardy; Charles Lefebvre; Countess of Oxford, a good rose; Crimson Bedder, does well; Docteur Andre; Duchess of Teck, not robust; Duke of Edin-

SYCAMORE AND SCRUB

In full exposure to the sea at Scarborough (South Cliffs).

burgh; Her Majesty, most robust; Gloire de Margottin, most brilliant scarlet; Merveille de Lyon, robust; Mrs. John Laing, excellent; Prince Camille de Rohan; Reynold's Hole; Marie Bauman, very good. *Noisette.*—Ophirie, very handsome.

CHAPTER VII

TREES AND SHRUBS FOUND GROWING ON THE YORKSHIRE COAST

Owing to the exceedingly variable climatic influences which surround the shores of the British Isles, it would be practically impossible to give special lists of plants to meet every case. The list herein given will be found the most generally useful, as it is taken from one of the coldest and bleakest districts. On the coasts of Devon, Cornwall, the West of Ireland, and some other parts, where the winters are milder, tenderer kinds of plants will grow, such as Camellias, Indian Azaleas, Fuchsias, Coronillas, Eucalyptus, and others, as well as Palms and other sub-tropical plants in variety. In these milder places, and where it is desired to grow collections or special kinds of plants, which may usually be grown in greenhouses in this country, careful observations should be taken of what has already been done in the same or similar districts, and the planting carried out according to local conditions.

Every species of tree and shrub contained in the following pages, with the exception of the Tamarisk and *Atriplex Halimus*, have been noticed as growing on the Yorkshire coast. Care has been taken not to include any, with the above exceptions, which have not been observed in one place or another. There may be others which are not included, but there is herein contained abundance of material to answer the purpose of any selection for planting that may be required.

The Tamarisk and *Atriplex Halimus* have been included, as the former is often mentioned as a valuable seaside plant, and it is such on the southern and south-eastern coasts, but it does not appear to be much known in the north; the Atriplex also succeeds well in similar situations. Both these might be tried in some of the more sheltered places by the sea in the north.

In addition to the generic, the popular names as far as possible have been given. The native habitat and date of introduction when imported of each species have been added as matters of interest to the readers, and the character of the tree or shrubs, as deciduous or evergreen, to simplify arrangements for planting.

Wherever the height of Conifers is given, the figures represent the average height of each in its native habitat. Great care has been taken to render this descriptive list as accurate as possible.

Abele. See *Populus alba.*

Abies cephalonica (syns. *Picea cephalonica, Pinus cephalonica*), Mount Enos or Grecian Silver Fir. This species is closely allied to the Common Silver Fir. Some authorities consider it a variety. It is a very desirable tree for exposed situations, and is found growing on Mount Enos, the highest mountain in the island of Cephalonia, at from 3000 to 4000 feet altitude. Soil a good light loam. Introduced to this country by General Napier when he was Governor of Cephalonia. Evergreen; height 50 to 60 feet.

Abies concolor (syns. *A. lasiocarpa* and *A. Parsonii*). A beautiful species with yellow bark on the young branches. It makes a noble and handsome tree, but cannot bear exposure by the seaside; will grow under shelter. Evergreen; height 80 to 150 feet. California, 1851.

Abies Douglasii. See *Pseudotsuga Douglasii.*

Abies excelsa. See *Picea excelsa.*

Abies Lawsoniana. See *Chamæcyparis Lawsoniana.*

Abies nobilis (syns. *Pinus nobilis* and *Picea nobilis*), Noble Silver Fir. A majestic tree. Its fine spreading branches, with the foliage bluish green on the upper part, and silvery underneath, produce a fine effect, especially when one is standing underneath and looking up through the tree to the sky. It is very hardy. In California

it forms vast forests, and is found at high elevations, sometimes 6000 to 8000 feet altitude. Like all other Silver Firs it succeeds best on the slopes of hills, on those sides which are shaded from the sun at mid-day. In very dry, sunny positions it suffers much from drought. It prefers a rather light deep loam, but will succeed in any good garden soil. The wood is soft, and it only makes a second-rate timber tree (Mr. Barry says he made a gate of the wood of this tree at thirteen or fourteen years from planting, which is still good after twelve years' use). In positions near the sea it is found to be a little tender, but on the Fyling Hall estate, farther inland, it has proved itself to be the most successful of the Coniferæ in half shelter. The north-east winds often affect the feather, and birds spoil the leaves by selecting it for perching upon on account of its prominence. It requires nursing when young. Evergreen; introduced from California in 1831; height 200 to 300 feet.

Abies nordmanniana (syns. *Pinus nordmanniana*, *Picea nordmanniana*), Crimean Silver Fir. A stately tree, and generally considered to be one of the hardiest of the Silver Fir group; but it hardly bears this character by the seaside on the Yorkshire coast, where it is a little uncertain. It does not begin to grow until the spring is far advanced, consequently its young shoots and

foliage are not so liable to frost bites from spring frosts as those of earlier growth, as the Common Silver Fir and others, especially when the trees are young and close to the ground. Evergreen; Crimea, 1848; height 80 to 100 feet.

Abies orientalis. See *Picea orientalis.*

Abies pectinata, Common Silver Fir. This noble Silver Fir is very slow-growing while it is young, but when it is established and gets well away from the ground it then begins to grow rapidly, soon overtopping some of the other trees. In exposed positions by the seaside it must have shelter until well established, then it is magnificent, but loses its feather when exposed or half exposed to the north-east. It will succeed in good light soil or good garden soil. It is useful for mixed groups, or in plantations. It is a fine and useful timber tree. Single specimens are handsome. Evergreen; Central Europe, 1603; height 80 to 100 feet.

Abies Pinsapo (syn. *Picea Pinsapo*), Spanish Silver Fir. A grand species, very beautiful and symmetrical in all stages of its growth. It grows slowly and rather bushy when young. When well established it grows more rapidly. The above is the general description of this handsome tree, but by the seaside it seems very delicate and very difficult to advance in growth. On the Fyling Hall estate its near relative, *A. cephalonica*, has

A LARGE SYCAMORE TREE;

To the right is a large Lime tree and garden shrubs; north-east exposure (Fyling Hall Estate).

done very much better. Evergreen; South Spain, 1839; height 60 to 80 feet.

Acer Pseudo-platanus, Mock Plane Tree, Sycamore. This tree is largely planted on the Yorkshire cliffs, and is one of the hardiest and most useful for the first line of exposure, especially where the soil is light, dry, and deep. It will succeed in almost any soil where it is open and free, but does not answer so well where its roots are near the clay. As it is of early growth its young shoots are often much injured by gales off the sea in spring, but the tree soon recovers, and thick, stunted, bushy top growth is the result. As the main object when planting trees in such positions is to secure an efficient break to the winds, so as to afford shelter beyond, it answers this purpose admirably. Deciduous; mountains of Central Europe and Western Asia. Introduced into England during the fifteenth century.

Æsculus Hippocastanum, Common Horse Chestnut. A well-known hardy tree, thrives best in good, rich, deep soil. It grows rapidly, when sheltered, near the sea. As it is of early growth in spring its young leaves are often destroyed when exposed to north-east winds. Deciduous; indigenous to the mountains of Greece; Asia, 1629. There are several ornamental garden varieties producing red and pale coloured flowers.

Alder. See Alnus.

Alnus glutinosa (Alder). Grows quickly in moist lands and swamps. In good soil and where its roots can reach the water it will sometimes grow to the height of 50 or 60 feet. Useful to plant on the cliffs in mixture with others, in plantations as a nurse to other trees, and on the banks of streams or ponds. Deciduous; indigenous to Britain.

American Arbor-vitæ. See *Thuja occidentalis.*

Araucaria imbricata, Monkey Puzzle and Chili Pine. To judge from the fine specimens seen growing at Mulgrave, Fyling Hall, and one or two other places, this may be considered as one of the hardiest trees under very little shelter by the seaside. To grow the tree well it should be planted in an open, airy situation in rather light, deep soil on hilly slopes, or on the edge of a steep hillock where there is a quick drainage. The specimens shown in the illustration are from 30 to 40 feet high, in magnificent health, and feathered quite to the bottom. They are twenty-five years old from the planting, at which time they were from 6 to 12 inches high. The trees shown illustrate the advantage of a good soil preparation before planting. The position in which they are now growing was formerly an old stackyard. The ground was raised to the level of the wall with good soil, and the young trees planted close to the edge of the wall, where they are now grow-

ing strongly, as has been described. At the other end, where the soil has not been made up, the trees are not so luxuriant. This Araucaria was introduced from Chili in 1796. It forms vast forests at high altitudes on the slopes of the Andes, often reaching to the snow line. Evergreen; height 50 to 100 feet.

Arbor-vitæ, American. See *Thuja occidentalis.*

Arbor-vitæ, Giant. See *Libocedrus decurrens.*

Arbutus Unedo, the Strawberry Tree. An ornamental shrub, bearing light coloured flowers and ripe scarlet fruit both at the same time in autumn. The fruit often hangs through the winter. A fine specimen, between 6 and 7 feet high, is to be seen at Fyling Hall; it is well sheltered among other shrubs. It requires light, warm soil and a good sheltered situation. Evergreen; indigenous West of Ireland and Southern Europe.

Ash. See Fraxinus.

Atriplex Halimus. A hardy shrub by the seaside on the southern and western coasts, but not quite proved on the north-east.

Aucuba japonica. A very hardy shrub. Mr. Barry speaks of it as "the best evergreen he has for withstanding the blast from the fatal quarter," and the more open the soil is kept the greater resistance it shows. In the shrubberies where the soil is not kept open by digging, it is very slow in establishing itself. The illustration shows

the Aucuba treated in this way by digging, etc. It is a good shrub for planting under trees in shrubberies. The female plants bear scarlet berries in autumn when males are planted near them. Sometimes the flowers of the male plant ripen their pollen before those of the female are ready to receive it; it should then be collected with a camel's hair brush, placed upon a piece of dry glass, and covered with another dry piece. When the stigmas of the female look sticky or gummy, then they are ready to receive the pollen. Evergreen; Japan, 1783. There are numerous varieties of both male and female forms.

Austrian Pine. See *Pinus austriaca.*

Barberry. See *Berberis vulgaris.*

Bay, Sweet. See *Laurus nobilis.*

Beam Tree. See *Pyrus Aria.*

Beech. See Fagus.

Berberis Aquifolium. See Mahonia.

Berberis vulgaris, Common Barberry. This is sometimes used as a hedge plant and in shrubberies. It is fairly hardy by the sea. Deciduous; Britain. There are several very ornamental species of Berberis.

Betula alba, White, Silver, or Common Birch. A valuable tree for plantations. It is excellent for planting in the exposed parts of enclosures inland, and is also useful for skirting plantations and clumps of trees to nurse more tender subjects.

A ROW OF FINE ARAUCARIA IMBRICATA
(FYLING HALL ESTATE).

LUXURIANT GROWTH OF AUCUBA JAPONICA

In the front. At the back of this a tall Common Holly, and an Irish Yew, with a small *Chamæcyparis obtusa plumosa* (*Retinospora plumosa*) in the front of it; Privet and other shrubs in the background; full exposure to the east (Fyling Hall Estate).

In high, exposed situations it becomes a dwarf shrub. At Scarborough it succeeds fairly well if not in too exposed a situation. It is very hardy inland, but does not appear to be very partial to sea atmosphere. At Fyling Hall the trees are subject to a blight from this cause, which destroys all the foliage and often kills trees even up to fifteen years old. The common species and all the Betulas thrive in almost any soil, but those of a light sandy character suit them best. Deciduous; indigenous to Britain.

Birch. See Betula.

Bird Cherry. See *Cerasus Padus.*

Bhotan Pine. See *Pinus excelsa.*

Black Pine. See *Pinus austriaca.*

Blackthorn. See *Prunus spinosa.*

Box. See Buxus.

Broom. See *Cytisus Scoparius.*

Buckthorn. See Rhamnus.

Buckthorn, Sea. See Hippophæ.

Burgundy Pitch Tree. See *Picea excelsa.*

Butcher's Broom. See *Ruscus aculeatus.*

Buxus sempervirens, Common Box. This popular shrub will succeed in any light, free, or well-drained soil. It succeeds well by the seaside, under partial shelter, at Scarborough. At Fyling, Mr. Barry says he has not tested it thoroughly, but he has had no specimens spoilt by the north-east winds, and should rank it with Aucuba above

Holly and far above Yew for hardiness; he also finds it painfully slow in growth in undug soil, but it responds well to good cultivation. Indigenous to western and southern Europe; in Britain only in some localities in southern England, and even there it is doubtful whether it may not have been introduced, as it has long been planted in shrubberies; evergreen. There are numerous forms worth consideration for planting in shrubberies. The golden variety, *B. s. aurea*, is very ornamental.

Carpinus Betulus, Common Hornbeam. Useful for planting in exposed situations to shelter other trees. It thrives best in rich, deep, rather moist soil, but not in dry sunny exposures; it makes a fine ornamental tree with a thick spreading top. Also used as a hedge plant. Deciduous; Britain. There are several ornamental garden varieties.

Castanea sativa, Sweet or Spanish Chestnut. When sheltered from the sea this tree grows as rapidly as Sycamore. It grows splendidly with some slight protection, as that afforded by other trees, both at Fyling and Scarborough; in the former place there are some trees thirty years old from planting which are thriving well. A good sandy loam, deep and dry, suits it, but it does not thrive so well in a strong clay or cold-bottomed soil. A warm, sheltered position is an important consideration if it is desired to mature its fruits.

Deciduous; indigenous South of Europe and Asia Minor. It has been cultivated in this country from time immemorial.

Cedar. See Cedrus.

Cedar of Lebanon. See *Cedrus Libani.*

Cedrus atlantica, Mount Atlas Cedar. This has been noted by Mr. Beeforth as one of the hardiest and grandest trees for the seaside, especially under partial shelter from the north-east. A free, open soil and subsoil is indispensable to the successful cultivation of all the Cedars. *C. atlantica* is of quicker growth than the Cedar of Lebanon, and of a more erect pyramidal habit. It is an introduction from the Atlas Mountains in Algeria in 1843, where it is found at 7000 to 8000 feet altitude. Evergreen; height 80 to 120 feet.

Cedrus Deodara, Deodar or Indian Cedar. The Deodar and the Austrian Pine are mentioned by Mr. Beeforth as being the two hardiest evergreen trees for the coast; but Mr. Barry states he has found the former to be of little use, when quite exposed to the north-east, as it loses its feather on that side, but that it is luxuriant in half shelter. It is a tree of graceful habit, and as it is hardy might be more largely grown on the coast. For notes on the essential soil conditions, see *C. atlantica.* Introduced from the Western Himalayas in 1822, where it is found at from 4000 to

12,000 feet altitude. Evergreen; height 150 to 200 feet.

Cedrus Libani, Cedar of Lebanon. This tree is not nearly so hardy by the seaside as *C. atlantica* or *C. Deodara*. In a cottage garden in Thorpe, near Robin Hood's Bay, unsheltered by other trees, but under shelter of a hill, is a fair specimen. It is a hardy tree inland and requires an open position to show its fine form and wide spreading branches. Introduced from Mounts Lebanon and Taurus in 1683, where it is found at 4000 to 6000 feet altitude. Evergreen; height 60 to 80 feet.

Cerasus Avium (syn. *Prunus Avium*), Wild Cherry or Gean. A well-known tree, sometimes found growing in plantations, where it often establishes itself naturally by means of its seeds or stones. It is hardy by the sea. It is very ornamental, especially when in flower, and as the flowers open early in spring, it is worthy of a place in pleasure grounds or in clumps of trees, where it is very effective. It likes a rich deep loam over a chalk subsoil, but will grow in almost any good well-drained soil. Indigenous to Britain.

Cerasus Laurocerasus, Common Laurel. Too well known to need much description. It is generally used in shrubberies and sometimes as a hedge plant. Near the sea, after a long period of north-east winds, the shrubs are a good deal cut,

A TALL CHERRY TREE ON THE LEFT.

The dwarfer kinds are chiefly Golden Elder, and Willow in variety. On the right are Mountain Ash, Cherry, Golden Elder, Turkey Oak, and Walnut trees in mixture. A row of Laurels, which are kept pruned, run along each side of the walk. Exposure north-east from off the sea (Belvedere Estate).

PORTIONS OF TWO HEDGES OF ESCALLONIA MACRANTHA,

Which are upwards of 100 yards long, on each side of the walk, and which are formed in clumps and bays, with a rose-bed in each bay. The hedge on the right nearest the sea is backed up by a wooden fence reaching nearly to its top. At the back of this are some Austrian Pines, which, however, have grown up since the Escallonia had reached its full height. In the distance is a view of the sea, and Castle Cliffs to the north (Belvedere Estate).

but generally soon recover, excepting where catching the full north blast. It should be planted under partial shelter from the keen winds. The Caucasian variety has been found to be hardier than the common one. Levant, 1629; evergreen. Some of the varieties of the Common Laurel are worth noticing, as angustifolia (narrow-leaved), camelliæfolia (camellia leaved), Caucasica (Caucasian), colchica (Colchican), rotundifolia (round-leaved), and variegata (variegated).

Cerasus lusitanica, Portugal Laurel. Also a well-known shrub, and will do better in heavier and damper soils than the Common Laurel, although it will grow well in almost any good soil. On the Fyling estate covered drains have been found filled with its roots. It thrives exceedingly well by the sea, under shelter from the north and north-east. Under such conditions of exposure it loses its foliage on the windward side. Evergreen; Portugal, 1648. The variety myrtifolia grows pyramidally like a bay.

Cerasus Padus (syn. *Prunus Padus*), Bird Cherry or Hagberry. This is very pretty in spring, with its long hanging racemes of white flowers. It will grow well under the shade of other deciduous trees, and therefore is well worthy of note. Deciduous; Britain. There are numerous forms of this species, named after the shapes and colours of their leaves.

Chamæcyparis Boursierii. See *C. lawsoniana.*

Chamæcyparis lawsoniana (syns. *C. Boursierii* and *Cupressus lawsoniana*). A well-known and exceedingly useful species, of easy culture and rapid growth. Succeeds fairly well under a little shelter by the sea, but is liable to be blown over by the winds, its roots being very superficial. On exposure it goes off on its north side and becomes one-sided. A cool, moist, but well-drained soil suits this species well. Evergreen; North California, 1863; height 75 to 100 feet. The varieties of this species are very numerous and some are very beautiful.

Chamæcyparis obtusa plumosa (syn. *Retinospora plumosa*). A pretty, dwarf tree from 15 to 20 feet high; does well at Fyling Hall under shelter. Evergreen; Japan. There are some pretty variegated forms of this species. The golden variety, *C. o. p. aurea*, is handsome at Fyling Hall.

Chamæcyparis squarrosa (syn. *Retinospora squarrosa*). A very pretty, dwarf tree or large bush from 4 to 6 feet high. It must be planted in well-sheltered situations as it is rather tender. Good garden soil. Evergreen; Japan.

Cherry Plum. See *Prunus cerasifera.*

Cherry, Wild. See *Cerasus Avium.*

Chili Pine. See *Araucaria imbricata.*

Choisya ternata is rather hardy in sheltered

situations near the sea. Evergreen; Mexico, 1825.

Cluster Pine. See *Pinus Pinaster.*

Cornus sanguinea, Dogberry; Common Dogwood. Branches straight, of a dark red colour. Will grow well under the shade and drip of deciduous trees, and can be readily increased by layers, suckers, or cuttings. At Fyling, in strong soil in shrubberies, it is so rampant that it outgrows everything, so that it is being rooted out; but at Scarborough (Belvedere) it does not succeed, no doubt owing to the different character of the soil. Deciduous; Britain.

Corsican Pine. See *Pinus Laricio.*

Corylus Avellana, Common Hazel. Well known as growing in woods and hedges. Deciduous; Britain, etc.

Cotoneaster frigida. This stands exposure from the west and south. It has been used at Fyling to protect Portugal Laurel on these sides. It makes a good break to the wind at 600 feet altitude; exposed to south-west winds, but sheltered from north. Sub-evergreen; Nepaul, 1824.

Cotoneaster microphylla. A very beautiful evergreen drooping tree. It will cover a wall as rapidly as Ivy. Good under partial shelter by the sea. Evergreen; Nepaul, 1824.

Crab. See *Pyrus Malus.*

Cratægus Oxyacantha, Hawthorn, White Thorn. Well known on account of its value as a hedge plant. It will succeed on dry hill slopes and banks, and will bear much exposure to keen winds at high elevations. Deciduous; Britain. It has numerous varieties, both single and double flowering, some of which are exceedingly handsome. They grow into nice-shaped trees.

Cryptomeria elegans, Elegant Japan Cedar. A handsome tree when well grown. It requires shelter from other trees, and a low-lying damp soil and situation. It flourishes well on the banks of streams, when placed rather high up, but so that its roots can reach the water. The soil must not be stagnant. It is good on the slopes of hills in partial shade a little distance from the sea. Good garden soil. Evergreen; Japan, 1861; 20 feet and upwards. In the island of Nippon it forms grooves round sacred edifices.

Cupressus lawsoniana. See *Chamæcyparis lawsoniana.*

Cupressus sempervirens, Common Upright or Italian Cypress. An upright tree, varying much in height according to soil and situation. Branches erect, and closely pressed to the trunk. It is not quite certain whether it will succeed on the Yorkshire coast, but it is being tried. A damp but not stagnant soil, or one of a deep, rich character, is suitable, and good conditions of

shelter are requisite. Used largely on the Continent for planting in churchyards and cemeteries. Evergreen; Southern Europe, 1548; height 60 to 100 feet.

Cypress. See Cupressus.

Cytisus Scoparius, Common Broom. A well-known hardy shrub. Some of the garden varieties are very handsome.

Deal Wood. See *Pinus sylvestris.*

Deodar Cedar. See *Cedrus Deodara.*

Diervilla rosea (syn. *Weigela rosea*). A useful and handsome flowering shrub, and has proved itself very hardy by the sea even under exposure to the north-east. It will grow on shrubberies or, in fact, anywhere, but requires a sunny position to make it flower freely. Deciduous; China, 1844.

Dogberry. See Cornus.

Dog Rose. See *Rosa canina.*

Dogwood. See Cornus.

Douglas Fir. See *Pseudotsuga Douglasii.*

Dwarf or Mountain Pine. See *Pinus montana.*

Elder. See Sambucus.

Elegant Japanese Cedar. See *Cryptomeria elegans.*

Elm. See Ulmus.

Escallonia macrantha. Too much cannot be made of this beautiful shrub when under partial shelter by the sea. At Scarborough it grows

rampant, and also in several gardens at Fyling Hall, Thorpe, near Robin Hood's Bay, and other places. As a hedge plant it will bear cutting well. In full exposure its leaves are sometimes injured by the winds. It succeeds in any ordinary well-drained soil. Evergreen.

Euonymus europæus, Spindle Tree. Common in hedges and thickets in many parts of England. Deciduous; Britain.

Euonymus japonicus. Both the green and the golden varieties of the Euonymus take the lead as being amongst the hardiest and most useful of evergreen shrubs for the seaside; both in the open and as undergrowth in shrubberies. They are useful as hedge plants, being hardier than the Privet and not so much cut up by the winds. It is largely planted at Scarborough, and magnificent hedges are seen in many places on the English coast. As they are so easy to cultivate, and will strike freely from cuttings near the sea, they should be more largely grown. They will succeed in any good soil. Evergreen; Nepaul, 1804. There are several varieties, some of which are very handsome, named according to the markings and colour of the foliage.

Evergreen Oak. See *Quercus Ilex.*

Fagus sylvatica, Common Beech. By the seaside the Common Beech is fairly good when well established and under partial shelter afforded

by other trees. It succeeds in rather dry positions; a deep, light soil over limestone suits it well, but it is not good on heavy soils. It does not stand the winds from the north and east. It makes a good hedge plant. On the Fyling Hall estate large Beech trees on rocky sandstone suffer much from the Felted Beech Coccus (scale), *Cryptococcus fagi*. It is generally classed among trees which will not grow by the seaside, but Mr. Beeforth says "this is a mistake": it is difficult to grow at first, but when well established this beautiful tree when protected is as great a success as any other species. Deciduous; Temperate Europe.

Flowering Currant. See Ribes.

Fraxinus excelsior, Common Ash. This is one of the hardiest trees for planting in the teeth of the winds in the first line of exposure on the eastern coast. As it is very late in coming into leaf, the young shoots are not so liable to injury from the winds in spring as the Sycamore and others of early leafage. It is also one of the first trees to lose its leaves in autumn. It will accommodate itself to most soils, but succeeds best in heavy, well-drained lands, if not too clayey, in low-lying situations, where the soil is moderately free and rich. It will flourish in the heavier soils where the Sycamore and Elm will not thrive, and this should be noted when arranging for planting

by the seaside. When drain-pipes are used in land on which the Ash is planted, they soon become filled with its roots; this is rather a drawback. Deciduous; Britain.

Furze. See *Ulex europæus.*

Garrya elliptica. An ornamental shrub trained to a wall or under shelter in shrubberies. Good in such positions by the sea. It is much prized for its long pendulous catkins, male and female, which are borne on separate plants. The catkins on the male plants are more ornamental than those on the female. Evergreen; California, 1818.

Gean. See *Cerasus avium.*

Ginkgo biloba (syns. Salisburia). An interesting and handsome tree, very difficult to grow by the sea in Yorkshire, even under good shelter. One or two fair specimens are seen in the more central parts of the country, but it can only succeed in the north under the best of shelter. Any good garden soil will suit this tree. Deciduous; Northern China, 1754; height 60 to 80 feet.

Goat Willow. See *Salix caprea.*

Gorse. See *Ulex europæus.*

Grecian Silver Fir. See *Abies cephalonica.*

Griselinia littoralis. A hardy shrub grown at the Belvedere, Scarborough, where it proves hardy by the sea, but not quite so much so

TWO ASH TREES IN FULL EXPOSURE TO KEEN WINDS.

A clump of trees in mixture to the left (Fyling Hall Estate).

A SCOTCH LABURNUM ON THE FYLING HALL ESTATE

At 700 feet altitude, in full exposure on all sides to the keenest winds. The effects of exposure at such high altitudes near the coast upon some Larches and other trees are seen in the background.

as the Euonymus. It will grow under trees or anywhere. Soil, a good loam. Evergreen; New Zealand, 1872.

Guelder Rose. See *Viburnum Opulus.*

Hagberry. See *Cerasus Padus.*

Hawthorn. See *Cratægus Oxyacantha.*

Hazel. See *Corylus Avellana.*

Hedera Helix, Common Ivy. A useful plant in many ways; is grown largely everywhere. Evergreen; Britain, Western and Southern Europe, etc.

Hemlock Spruce. See *Tsuga canadensis.*

Hippophæ rhamnoides, Sea Buckthorn. A hardy shrub of easy culture, and largely planted by the sea. It is found on the cliffs at Scarborough; but Mr. Beeforth thinks it is much overrated as a seaside shrub. He finds that it is not nearly so hardy as the Goat Willow. It is recommended for fixing sands, in common with Carex and other maritime plants. When used for this purpose, the branches may be layered in the ground, where they will strike root, and then they will possess much greater holding power. It will grow in almost any soil, and is easily propagated, either by root cuttings, layers, cuttings from the branches, or seeds. Deciduous; Britain, Europe.

Holly. See Ilex.

Hornbeam. See *Carpinus Betulus.*

Horse Chestnut. See Æsculus.

Ilex aquifolium, Common Holly. This is one of the commonest and hardiest of evergreen shrubs inland. At Scarborough and other places it is found to be rather tender by the sea. The broad-leaved variety stands well in exposure on the cliffs in this town. It is useful as a hedge plant. At Fyling Hall, Hollies are mostly under shelter; the Golden variety stands better than the Common one. Inland it makes a dense ornamental hedge. Indigenous to Britain. There are innumerable varieties.

Indian Cedar. See *Cedrus Deodara.*

Irish Yew. See *Taxus baccata adpressa.*

Italian Cypress. See *Cupressus Lawsoniana.*

Italian Poplar. See *Populus pyramidalis.*

Ivy. See Hedera.

Juniper. See Juniperus.

Laburnum alpinum, Scotch Laburnum. One of the hardiest trees in cultivation, flourishing in the bleakest positions (see illustration). Useful by the sea. Deciduous; Europe. There are several varieties.

Laburnum vulgare, Common Laburnum. Highly ornamental as a spring flowering tree, but is not so hardy as the Scotch. Deciduous; South Europe, 1596.

Larch. See Larix.

Larix europæa, Common Larch. Fine larches

are found within easy distance from the Yorkshire coast, under conditions of shelter. They prefer the sheltered slopes of hills rather than the hilltops. The Larch is extremely sensitive to keen exposure and to winds off the sea, and should never be planted in such positions. It has been noted that when trees are growing in plantations, as soon as their tops reach the keen, biting winds they grow away from them, and the tops become stunted. It is of very early growth in spring, consequently the young shoots and foliage often suffer from keen winds and frost-bites. Larches thrive in a deep, light soil with perfect drainage, and are best when nursed up by other trees in mixed plantations. In the Cleveland districts, and some other parts of Yorkshire, larches suffer much damage from what is commonly known as "the Larch disease." Deciduous; introduced to England, 1629.

Laurel. See Laurus.

Laurocerasus. See Cerasus.

Laurus nobilis, Sweet Bay, Common Laurel. This interesting shrub flourishes luxuriantly by the sea in several parts of Yorkshire when sheltered from the north-east winds. It requires a good, deep, well-cultivated soil, with perfect drainage. This is the true Laurel. Evergreen; South Europe, 1562.

Laurustinus. See *Viburnum Tinus.*

Libocedrus decurrens (syn. *Thuja gigantea*), Giant Arbor-vitæ. A handsome and useful tree when sheltered near the sea. Evergreen; Sierra Nevada Mountains of California; height 40 to 140 feet.

Ligustrum massalongianum (syn. *L. myrtifolium*). A useful species of Privet by the sea. Evergreen; Khasia Hills, 1877.

Ligustrum myrtifolium, Myrtle-leaved Privet. See *L. massalongianum*.

Ligustrum ovalifolium, Oval-leaved Privet. This is larger-leaved than the Common Privet (*L. vulgare*), and a much better species for garden cultivation. It is also one of the hardiest of privets by the sea. It will, like the common Privet, grow under trees, is useful as a hedge plant and in other ways. Privets succeed well in almost any soil. They are much cut up on keen exposure by the seaside, and lose their leaves in winter in such situations. Japan.

Ligustrum vulgare, Common Privet.

Lime Tree. See Tilia.

Linden Tree. See Tilia.

Lombardy Poplar. See *Populus pyramidalis.*

Lycium barbarum. One of the hardiest plants in positions of the keenest exposure by the sea. Useful for training over rough places (see Chap. V.). A climbing shrub, easily propagated by suckers, layers, or cuttings. A light, well-

drained soil suits it best, but will grow almost anywhere. Deciduous; North Asia, 1696.

Mahonia Aquifolium (syn. *Berberis Aquifolium*). A useful plant for undergrowth in shrubberies and plantations. Evergreen; North America, 1823.

Mammoth Tree. See *Sequoia gigantea.*

Maple. See Acer.

Maritime Pine. See *Pinus Pinaster.*

Mock Orange. See *Philadelphus coronarius.*

Monkey Puzzle. See *Araucaria imbricata.*

Monterey Pine. See *Pinus insignis.*

Mountain Ash. See *Pyrus aucuparia.*

Mount Atlas Cedar. See *Cedrus atlantica.*

Mount Enos Fir. See *Abies cephalonica.*

Myrobalan Plum. See *Prunus cerasifera.*

Norway Spruce. See *Picea excelsa.*

Oak. See Quercus.

Olearia Haastii, sometimes called the "Olive" in allusion to its resemblance to that tree. A very hardy dwarf shrub by the seaside, and will succeed in almost any soil. It may be seen at Scarborough, Whitby, and other places along the coast, flourishing in the most exposed situations. Evergreen; New Zealand.

Olive. See *Olearia Haastii.*

Oriental Spruce. See *Picea orientalis.*

Pear Tree. See *Pyrus communis.*

Philadelphus coronarius, Mock Orange or

Syringa. A favourite flowering shrub in gardens. It will not bear the cold winds by the sea in the east, but does well when sheltered. Some varieties bear double flowers. Deciduous; South Europe, 1596.

Picea cephalonica. See *Abies cephalonica.*

Picea excelsa (syn. *Abies excelsa*), Burgundy Pitch Tree, Norway Spruce. A well-known Pine, which grows to a great height. Near the sea it must be sheltered by high hills or by high trees in quantity. It will not thrive in shallow soils, or where it is subject to drought. In deep, well-drained situations it often makes fine timber. Evergreen; North of Europe, particularly Norway, 1548. There are many varieties of this species.

Picea nobilis. See *Abies nobilis.*

Picea nordmanniana. See *Abies nordmanniana.*

Picea orientalis, Oriental Spruce (syn. *Abies orientalis*). A dense-growing lofty tree. It grows slowly while it is young; but after a few years, when it gets well established, it goes away rapidly. Cultural conditions and about the same degree of hardiness as for the Norway Spruce. Evergreen; Taurus and Caucasus, 1825.

Pinus austriaca, Black or Austrian Pine. This is without exception the hardiest of evergreen trees for the eastern coast. It appears able to

bear any amount of exposure even in the bleakest situations, and also to stand the gales and sea breezes. Although fine timber cannot be expected under such conditions, it is very useful as a means of shelter to other things. When they are planted thickly and close to deciduous trees they soon lose their lower branches. Evergreen; Austria, 1835; height 75 to 100 feet.

Pinus excelsa, Bhotan Pine. Good well-grown specimens of this make handsome trees. With attention, and in good deep soil and sheltered situations, it will succeed in gardens near the sea. Evergreen; Himalayas, 1827; height 60 to 150 feet.

Pinus insignis (syn. *P. radiata*), Monterey Pine. This is one of the handsomest of the Pines. It ought to thrive well with good shelter some little distance inland, but it must be sheltered from strong winds and at the same time have plenty of air. In warm situations it makes autumn growths, which, being tender, are liable to be injured by frosts. It prefers a rather dry soil of a deep, rich character. Evergreen; introduced from California by Douglas, 1833; height 80 to 100 feet.

Pinus Laricio, Corsican Pine. A tall, rapid-growing tree of strictly erect habit. Generally considered to be very hardy. It is better suited for richer soil in lower situations than many pines.

It suffers from autumn frosts inland when exposed to the morning sun. Evergreen; South Europe, 1814; height 100 to 150 feet. There are several varieties.

Pinus maritima. See *Pinus Pinaster.*

Pinus montana. See *Pinus Mughus.*

Pinus Mughus (syn. *P. montana*). A low-growing shrubby tree from 5 to 15 feet in height, according to soil and situation. It is of little use by the seaside, as at its best it only grows into a very stunted dwarf shrub. Farther inland it sometimes grows into nice specimens. *P. montana* is considered by some authorities to be a synonym of *P. Mughus*, which it closely resembles. Evergreen; mountains of Central Europe, 1779.

Pinus nobilis. See *Abies nobilis.*

Pinus nordmanniana. See *Abies nordmanniana.*

Pinus Pinaster (syn. *P. maritima*), Cluster or Maritime Pine. A most useful hardy tree near the sea, but very slow-growing. Farther inland it grows rapidly, and makes a rather handsome tree, forming a heavy, dense foliaged top, generally leaning to one side. It is rather difficult to transplant, and perhaps it is on account of failures from this cause that it is not more generally grown. It has a long tap root, which goes down deeply into some soils. Seedlings two years old, from the seed-bed, seldom succeed when transplanted.

It is a good plan to secure one-year-old seedlings from the nursery seed-bed, and to transplant some to permanent position, or, better still, to sow the seeds where they are intended to remain. A deep, dry, rather sandy soil suits it best, and rather low-lying situations in preference to elevated ground. When planted on the slopes, in ravines, or similar positions, the roots are useful to keep up the soil where it is liable to slip. Evergreen; South-West Europe, 1596; height 60 to 80 feet.

Pinus radiata. See *Pinus insignis.*

Pinus sylvestris, Deal Wood, Fir Tree, Scots or Wild Pine. This is grown extensively as a forest tree, but is not good to plant in keen exposure by the sea. Mr. Beeforth says it does not answer well with him, and he cannot recommend it to plant close by the seaside. Mr. Barry states that he planted some Scots Pines in 1878 on sloping ground, and sheltered by other trees from north and north-east exposure, which are now (1905) upwards of 30 feet in height, and growing luxuriantly. The trees would not grow when first planted until protected by boards; they do not stand the gales on the seaward side, especially when they are young. Scots Firs are very accommodating with respect to soil, but prefer a rather light or gravelly loam, overlying rock or gravel. It is the only one of the Pines truly

indigenous to Britain. Height 50 to 100 feet; evergreen.

Poplar. See Populus.

Populus alba, Abele, White Poplar. This grows in abundance by the seaside and is very hardy. It forms short scrubby growths on the cliffs when exposed to the gales, and is useful to plant in such positions. Poplars thrive under a variety of conditions as regards soil, but succeed best in damp situations, as along watercourses, etc. All are readily increased from cuttings inserted in open ground in autumn. Deciduous; Britain.

Populus pyramidalis, Italian or Lombardy Poplar. A tree of erect pyramidal habit, succeeding fairly well at Scarborough and one or two other places near the sea. Deciduous; Italy, 1758.

Portugal Laurel. See *Cerasus lusitanica.*

Privet. See Ligustrum.

Prunus avium. See *Cerasus avium.*

Prunus cerasifera, Myrobella, Cherry or Myrobalan Plum. Grown as a hedge plant, or in coppice, etc. Deciduous; native country uncertain.

Prunus communis. See *Prunus spinosa.*

Prunus Padus. See *Cerasus avium.*

Prunus Pissardii. Hardy by the sea; reddish-purple foliage. Deciduous; Persia.

Prunus spinosa, Blackthorn or Sloe. Well known as a hedge plant. Deciduous; Britain.

Pseudotsuga Douglasii (syn. *Abies Douglasii*), Douglas Fir. A magnificent species. It grows when sheltered near the sea in Yorkshire. The tops are liable to injury when reaching exposure on high lands. It is found in large forests on the Rocky Mountains. Evergreen; North America, 1826; height 100 to 180 feet.

Pyrus Aria, White Beam Tree. Very hardy and good for exposed positions by the sea. It is useful as affording shelter to other trees, and is equally good on light or heavy soils. It grows well in moist soils, and makes the best shelter when cut down to stool out. Deciduous; indigenous to Britain.

Pyrus aucuparia, Mountain Ash or Rowan Tree. Another very hardy and handsome tree, standing exposure well. Deciduous; Britain.

Pyrus communis, Wild Pear. Very hardy, and will grow in the most exposed places, but under such conditions it loses its erect habit of growth. Deciduous; Britain.

Pyrus Malus, Crab, Wild Apple. Very hardy on dry hills and slopes at high elevations. Deciduous; Britain. There are several highly ornamental flowering species.

Pyrus prunifolia, Siberian Crab. Highly ornamental. Will grow well under exposure by

the sea. Its flowers are handsome, and the fruit when ripe is red on its sunny side and yellowish on that which is shaded. It can be eaten when decayed, like the medlar. Deciduous; Siberia, 1758.

Quercus austriaca sempervirens. See *Q. glandulifera.*

Quercus Cerris, Turkey Oak. Grows well by the seaside. Acorns mossy-cupped. Deciduous; South Europe, etc., 1735.

Quercus C. lucombeana. See *Q. C. subperennis.*

Quercus C. subperennis (syn. *Q. C. lucombeana*). This is growing in the pleasure grounds at Fyling Hall, where sheltered from other trees; sub-green.

Quercus glandulifera (syn. *Quercus austriaca sempervirens*). This also grows well under shelter at Fyling Hall, and is one of the best of the evergreen oaks which are grown there. Japan, 1870.

Quercus Ilex, Evergreen, Holly or Holm Oak. A well-known and favourite tree. Very hardy by the sea, where partially sheltered. Evergreen; South of Europe, 1581.

Quercus pedunculata (*Robur*), Common English Oak. Succeeds well by the sea, and is one of the hardiest trees for planting in the first line, but it is rather slow-growing. It is suitable for planting in the heavier classes of soil, where the Sycamore

GROUPS OF AUSTRIAN PINE ON THE LEFT,

With small Spruce in front. A group of Corsican Pines on the right. North-east exposure from the sea (Belvedere Estate).

A HANDSOME EVERGREEN OAK (QUERCUS ILEX),
Sheltered by the house and a few trees in the pleasure ground (Field House, Whitby).

and Wych Elm do not succeed so well. When planting oaks in plantations, etc., they should be mixed with other kinds of trees such as Scots, Austrian, Corsican Pine, Larch, etc. etc., which will act as nurses until they grow into size. Deciduous; Britain. There are several varieties.

Quercus pedunculata fastigiata. Pyramidal in habit, makes a handsome tree. Hardy by the sea.

Quercus pyramidalis. See *Quercus pedunculata fastigiata.*

Quercus Robur, Black Oak, Common Oak. *Q. pedunculata* and *Q. sessiliflora* as sub-species are the British representatives of this genus.

Quercus sessiliflora, Sessile Oak. Also hardy by the sea. Deciduous; Britain.

Quickthorn. See Cratægus.

Red Fir. See *Pseudotsuga Douglasii.*

Retinospora. See Chamæcyparis.

Rhododendrons grow freely in places at some little distance from the sea. *R. ponticum* is useful as undergrowth in plantations, etc., where it forms good covert. Seedlings of some of the better kinds, and *R. catawbiense*, may also be used for the same purpose. The hybrid Rhododendrons are a very beautiful section and are largely planted in gardens and pleasure grounds. Rhododendrons will succeed in a good loamy soil. Peat and leaf-mould is a favourite compost. Chalk, limestone, or a limestone soil is fatal to them.

Rosa rugosa, Japanese Rose. Very hardy by the sea. Japan, 1845.

Ruscus aculeatus, Butcher's Broom. A well-known hardy shrub. Evergreen ; Britain.

Salix alba, White Willow. Very hardy by the sea, and grows upon the cliffs in full exposure. It is useful as a nurse to other trees in plantations under exposure. Inland in good soil it sometimes gets blown down by the winds when it is top-heavy. Deciduous ; Britain.

Salix caprea, Common Sallow, Goat Willow. This is well known, as its branches with catkins are gathered for Palm Sunday, and are called "Palm." It is very hardy by the sea, growing in full exposure on the cliffs. It is not so tall as the White Willow, even when growing inland under the most suitable conditions. Deciduous ; Britain.

Salisburia. See Ginkgo.

Sallow. See *Salix caprea*.

Sambucus nigra, Common Elder. When sheltered from the sea this will grow anywhere, but in keen exposure it gets very much cut up in spring by the winds. It is useful to plant, as it grows in places, such as under trees, where it is difficult to establish anything else. Deciduous ; Britain.

Sambucus racemosa, Scarlet-berried. This is hardier than the Common Elder near the sea. Deciduous ; South Europe and Siberia, 1596.

Scotch Laburnum. See *Laburnum alpinum*.

Scots Pine. See *Pinus sylvestris.*

Scots or Wych Elm. See *Ulmus montana.*

Sea Buckthorn. See *Hippophæ rhamnoides.*

Sequoia gigantea (syn. *Wellingtonia gigantea*), Mammoth Tree. Although many fine specimens may be seen, this cannot be classed as one of the most successful trees for planting in this country, especially in some parts of the north. It grows rapidly under good conditions and makes a fine specimen. Often after a time it becomes rather stunted in growth and loses its lower branches, which spoils its appearance. A good soil-preparation is necessary previous to planting. It appears to thrive best in deep, open, or rather sandy soils, and under conditions of perfect drainage and in an open situation. If it is planted anywhere near the coast it must be sheltered, but it cannot be recommended. This in its native habitat is a gigantic tree. A specimen, which was known as the "Father of the Forest," measured 435 feet in height and 110 feet in circumference; these were the measurements of trunk of the tree when lying on the ground, and it is stated that it must have been much taller when living. Others are recorded upwards of 300 feet high. Evergreen; North-West America, 1853.

Siberian Crab. See *Pyrus prunifolia.*

Silver Fir. The popular name of *Abies pectinata.*

Silver Poplar. See *Populus alba.*

Sloe. See *Prunus spinosa.*

Snowberry. See *Symphoricarpus racemosus.*

Sorbus. Included under Pyrus.

Spanish Chestnut. See *Castanea sativa.*

Spanish Silver Fir. See *Abies Pinsapo.*

Spindle Tree. See *Euonymus europæus.*

Spruce Fir. A popular name for several species of Picea and other firs.

Strawberry Tree. See *Arbutus Unedo.*

Sweet Bay. See *Laurus nobilis.*

Sweet Chestnut. See *Castanea sativa.*

Sycamore. See *Acer Pseudo-platanus.*

Symphoricarpus racemosa, Snowberry.

Tamarisk. Most useful by the sea.

Taxus baccata, Common Yew. A well-known hardy tree which grows in the most exposed situations inland, but requires shelter from keen exposure near the sea. It thrives in almost any soil. Evergreen; Britain. There are several species of Yews and many varieties, some with very ornamental foliage. There are numerous forms of *T. baccata*, two of which are mentioned here. *Taxus baccata adpressa* grows well near the sea in Yorkshire. It is a seedling form, and was raised in Messrs. Dickson's Nursery, Chester. *T. b. fastigiata*, Irish or Florence Court Yew. A well-known ornamental pyramidally-shaped tree. It is very hardy under partial shelter near the sea.

A FINE IRISH YEW WITH GOLDEN HOLLIES

On its left; other kinds of trees and shrubs in mixture. On the right is a large Sycamore. In the background is seen a glimpse of Robin Hood's Bay to the east (Fyling Hall Estate).

Thuya gigantea. See *Libocedrus decurrens*, *Thuya Lobbi*, and *Thuya plicata.*

Thuya Lobbi (see also *Thuya plicata*). Some fine young specimens upwards of 30 feet high are growing in a sheltered place at Fyling Hall. There is much difficulty in naming this species, as different names are given to it by various authorities.

Thuya occidentalis, Common or American Arbor-vitæ. To grow this tree well it should be planted in rather deep, open soil. It thrives in a low-lying situation or well raised on the banks of streams, but generally it is of easy culture. Good shelter is required by the sea, as it is liable to be much cut up by the winds when exposed. Evergreen; North America, 1596; height 40 to 50 feet. There are several varieties.

Thuya orientalis, Chinese Arbor-vitæ. A low tree or bush 18 to 20 feet high. Evergreen; China and Japan, 1860. There are numerous varieties of this species.

Thuya plicata. "*Thuya Lobbi* is the true *T. plicata*, but is more generally known as *T. gigantea*" (Ed. *Gardeners' Chronicle*).

Tilia europæa. See *T. platyphyllos* and *T. vulgaris.*

Tilia platyphyllos (syn. *europæa*). This species is the earliest to flower. Europe, Britain.

Tilia vulgaris (syn. *T. europæa*), Lime Tree or Linden. A good tree for the seaside, and

stands a fair amount of exposure from the north-east; better than most trees, and is not very particular with respect to soil. Being a tree of the plains rather than of the mountains, it does not appear suitable to high altitudes. Europe, Caucasus (naturalised in Britain).

Tsuga canadensis, Hemlock Spruce. Not a good species of tree in exposed situations. It is of graceful habit, and thrives well in cool, moist, rich, deep soil, but it must be provided with shelter in order to grow well. It grows in abundance in the Canadian forests. Evergreen; North America, 1736; height 70 to 80 feet.

Ulex europæus, Common Furze, Gorse. Grows in abundance near the sea. It will not succeed in shade: requires an open position, as it is a light-loving plant. Britain. A beautiful double form of this is grown in gardens.

Ulmus montana, Scots or Wych Elm (mountain loving). One of the hardiest trees on the eastern coast for facing the strongest gales and storms, and should be largely planted where soil conditions are suitable. It luxuriates in a deep, rich, medium or sandy loam with a dry gravelly bottom, but will grow in almost any well-drained soil if not of too heavy a character. Mr. Barry finds its roots, however, terrible for drains. Deciduous; Britain. There are several highly ornamental varieties well worthy of cultivation.

Veronica decussata. See *Veronica elliptica.*

Veronica elliptica. Grows well at Fyling Hall. It is very beautiful when covered with large white flowers in August. It is generally classed as a half-hardy shrub. New Zealand, Chili, Fuegia, and Falkland Islands, 1776.

Veronica spicata. One of the hardiest dwarf shrubs by the sea-coast, and largely grown. Britain.

Viburnum Opulus, Guelder Rose. When partially sheltered in shrubberies near the sea. Britain.

Viburnum Tinus, Laurustinus. A well-known shrub, grows well when sheltered near the sea. Evergreen; Southern Europe, 1596.

Weigela. See Diervilla.

Wellingtonia. See Sequoia.

White Beam. See *Pyrus Aria.*

White or Silver Poplar. See *Populus alba.*

White Thorn. See *Cratægus Oxyacantha.*

White Willow. See *Salix alba.*

Wild Cherry. See *Cerasus avium.*

Wild Crab. See *Pyrus Malus.*

Wild Pear. See *Pyrus communis.*

Willow. See Salix.

Wych Elm. See *Ulmus montana.*

Yew. See Taxus.

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